

UNITED STATES OF AMERICA  
BEFORE FEDERAL TRADE COMMISSION

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Docket No. 9302

**PUBLIC VERSION**

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In the Matter of

RAMBUS INCORPORATED

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REPLY BRIEF  
OF COUNSEL SUPPORTING THE COMPLAINT

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UNITED STATES OF AMERICA  
BEFORE FEDERAL TRADE COMMISSION

In the Matter of

RAMBUS INCORPORATED,

a corporation.

Docket No. 9302

**REPLY BRIEF OF COUNSEL SUPPORTING THE COMPLAINT**

**INTRODUCTION**

Ever since its subversion of the JEDEC standard-setting process came to light, Rambus has insisted that it is not the perpetrator of a deceptive scheme to monopolize, but an innocent bystander. Rambus says that its intentional concealment of material information and its misleading conduct before JEDEC, all part of its plan to ambush the DRAM industry, should be ignored because JEDEC's rules weren't as clear as Rambus thinks they could have been. Rambus's success in concealing from the industry the true scope of its potential patent rights is of no consequence, says Rambus, because a handful of companies had limited information that – had they connected the dots correctly – might have allowed them to catch Rambus in the act, though they failed to do so. U.S. consumers, says Rambus, should willingly pay up to \$3 billion in unanticipated royalty costs for products designed and manufactured to a supposedly open standard.

Can Rambus be what its brief tries to portray – the innocent monopolist? Not when one

considers these facts, none of which Rambus contests:

- Rambus voluntarily joined and regularly participated in JEDEC for over four years.
- Rambus’s primary representative to the JC-42.3 Committee, Richard Crisp, told others at Rambus that “The job of JEDEC is to create standards which steer clear of patents which must be used to be in compliance with the standard whenever possible.” CX0903 at 2.
- Rambus representatives, including Vice President David Mooring, understood that JEDEC had a disclosure policy, observed regular presentations by Chairman Jim Townsend describing the disclosure policy, and observed and commented on other members’ disclosure of patents and applications.
- When Richard Crisp sought clarification of JEDEC’s disclosure policy, he was given the 21-I Manual. Mr. Crisp understood from this manual that JEDEC “wanted to know about both patents and applications that might relate to the works that were going on within JEDEC.” CX2104 at 852-53 (Crisp).
- Shortly after joining JEDEC, Rambus representatives met with outside patent counsel to discuss JEDEC, “preplanning before accus[ing] others of infringement,” and “Advising JEDEC of patent application.” CX1941 at 1. Counsel advised Rambus that “there could be [an] equitable estoppel problem” from JEDEC participation. CX1942.
- Rambus representatives believed that it had pending patent applications covering features considered for the JEDEC standards. CEO Geoffrey Tate set out this belief in a Rambus business plan. CX0543 at 17, CX0545 at 21.
- Rambus observed JEDEC proposals to include in the SDRAM standard programmable CAS latency and programmable burst length, among other technologies. Based in part on what it saw at JEDEC, Rambus filed amendments to its patent applications “directed against SDRAMs.” CX0702.
- Between the 1993 adoption of the SDRAM standard and Rambus’s 1996 withdrawal from JEDEC, Rambus observed JEDEC proposals on the Future SDRAM or Next-Generation SDRAM standard (later named DDR SDRAM) including proposals for programmable CAS latency, programmable burst length, on-chip PLL/DLL and dual-edge clocking.
- JEDEC had available, and actively considered, various specific alternatives to each of the technologies in question.
- Rambus actively planned to enforce its patents against fellow JEDEC members.

- Rambus never disclosed to JEDEC its issued ‘327 patent, its pending ‘651, ‘961, ‘490, ‘692 or ‘646 applications, its belief that it invented and could obtain patent rights covering specific technologies considered by JEDEC, or its on-going efforts to amend its applications to cover JEDEC standards.
- After quitting JEDEC, following CEO Tate’s instructions that “our leverage is better to wait,” Rambus continued to conceal its patent-related information. CX0919.
- Anticipating patent litigation against the industry, Rambus intentionally destroyed documents over a two-year period that it knew would be relevant to that litigation.
- After the industry adopted the DDR SDRAM standard, and after its own RDRAM architecture failed in the marketplace, Rambus began suing companies producing JEDEC-compliant products for patent infringement.
- As a result of its patents covering JEDEC-compliant products, Rambus now holds monopoly power and stands to collect up to \$3 billion in royalties from the industry and ultimately from consumers.

Though effectively conceding this conduct, Rambus argues that it should escape liability.

Rambus claims, for instance, that its conduct was not “exclusionary” and hence is beyond the reach of the antitrust laws. As explained below, case law and sound analysis show otherwise.

Rambus further claims that its conduct is justified by its business interest in protecting the confidentiality of trade secrets. But this would mean that companies could voluntarily join standards organizations and then disregard the organizations’ disclosure rules with impunity.

Rambus denies that JEDEC required member companies to disclose relevant patents and applications. But Rambus’s arguments are contradicted by JEDEC’s documents, management, and members, and by its own admissions. Finally, Rambus imagines a variety of scenarios to argue that even had it disclosed in good-faith compliance with JEDEC’s rules, the standards would have remained unchanged. This, too, is demonstrably false.

Throughout its arguments, Rambus dismisses the central documents and ignores the core testimony of 34 third-party fact witnesses, relying instead on tangential third-party documents

(often interpreted solely by Rambus's lawyers), selected bits of testimony, and a phalanx of paid experts. The case should not be decided on such fragments. The expansive record includes testimony from managers and engineers who collectively, since 1991, have been employed by 21 different companies spanning the entire industry. While their testimony differs in some details, the overall consistency among witnesses and with the central documents is striking. These documents and witnesses are corroborated by JEDEC, an organization of 250 corporate members that has no financial stake in the outcome of this litigation, but an enormous interest in the integrity of its procedures. JEDEC's testimony and amicus brief demonstrate that its members understand and support the policies and procedures it articulated. Rambus's position simply cannot be reconciled with the overwhelming weight of third-party testimony, the central documents, or its own admissions.

The truth is that Rambus voluntarily joined JEDEC, an organization whose members cooperated to develop open standards. Rambus misled JEDEC, its members and the industry at large into believing that the JEDEC standards were open, free of patents and available to all. Rambus perfected its patents, waited until the industry had locked itself in to JEDEC-compliant products, and then sued to collect the maximum royalties it could extract. These are not the acts of an innocent bystander, but of an opportunist that, having abused the JEDEC process to seize monopoly power, was found out after the fact.

**I. Rambus’s Conduct Was Exclusionary.**

**A. Antitrust Law Seeks to Prevent Anticompetitive Harm Resulting From Opportunistically Hijacking the Economic Power of Industry-Wide Standards.**

As explained in Complaint Counsel’s Appeal Brief, industry-wide standard-setting carries the potential for tremendous economic benefits, but also the risk of anticompetitive outcomes. Contrary to Rambus’s unsupported claim that collusion is the only antitrust concern in standard-setting (RB at 92-93, 106-08)<sup>1</sup>, it is well-established that unilateral “hold-up” (where a participant gains control over a standard and uses it for its own economic gain) is a proper subject of antitrust enforcement. *See* CCAB at 31-41.

Where organizations adopt policies intended to prevent hold-up, opportunistic and inefficient conduct that violates those policies or intentionally subverts the outcome in a manner that concentrates economic power is properly condemned as exclusionary.<sup>2</sup> This is so for two

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<sup>1</sup> The following abbreviations are used:

CCAB: Complaint Counsel’s Appeal Brief (April 16, 2004)

RB: Rambus’s Answering Brief (June 2, 2004)

JEDEC Brief: Amicus Curiae Brief of JEDEC (April 16, 2004)

SSO Brief: Brief of Amicus Curiae Consumer Electronics Ass’n et al. (April 16, 2004)

Scholars Brief: Brief Amicus Curiae of Economics and Scholars (April 15, 2004)

CCFF: Complaint Counsel’s Proposed Findings of Fact

CCRF: Complaint Counsel’s Reply Findings

ID: Initial Decision

Page references to testimony refer to the internal pagination of the designated deposition or trial transcript.

<sup>2</sup> CCAB at 31-41. Congress recently stressed that standards organizations should follow “principles that require openness, balance, transparency, consensus, and due process,” specifically providing for “balancing interests so that standards development activities are not dominated by any single group of interested persons” and for “readily available access to essential information regarding proposed and final standards.” Standards Development Organization Advancement Act of 2004 (“2004 Standards Act”), Pub. L. No. 108-237, § 102, 118 Stat. 661, 661-62. Rambus’s conduct denied access to essential information regarding

well-established reasons. First, when hold-up subverts the decisionmaking process of a standard-setting body, “a standard produced by that process does not promote competition,”<sup>3</sup> because “the hope of procompetitive benefits depends upon the existence of safeguards sufficient to prevent the standard-setting process from being biased by members with economic interests in restraining competition.”<sup>4</sup> Second, opportunistic conduct like Rambus’s, that violates the legitimate expectations of parties to a cooperative endeavor, lacks cognizable justification and is inefficient because it raises costs without providing any economic benefit.<sup>5</sup>

Rambus evades this point by misstating the core conduct at issue. The Complaint does not challenge Rambus’s abstract interest in preserving the confidentiality of, nor its abstract right to amend, its patent applications. RB at 86-92. Rather, the challenged conduct is Rambus’s renegeing on its voluntary agreement (express and implied) to cooperate in the JEDEC process,

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proposed and final standards in order to gain exclusionary power over JEDEC’s standards, foreclosing the very values that Congress seeks to promote.

<sup>3</sup> *Sessions Tank Liners, Inc. v. Joor Mfg. Inc.* (“Joor”), 786 F. Supp. 1518, 1530 (C.D. Cal. 1991), *rev’d on other grounds*, 17 F.3d 295 (9<sup>th</sup> Cir. 1994).

<sup>4</sup> *Allied Tube & Conduit Corp. v. Indian Head, Inc.* (“Allied Tube”), 486 U.S. 492, 509 (1988); *see generally* CCAB at 31-41; 2004 Standards Act, § 102, 118 Stat. at 662.

<sup>5</sup> CCAB at 34-36. Rambus’s argument that Chairman Muris’s 1981 article on opportunism was not discussing antitrust liability (RB at 105-06) not only ignores later remarks linking opportunism and antitrust (Timothy Muris, *Improving the Economic Foundations of Competition Policy*, Remarks at the George Mason University Law Review’s Winter Antitrust Symposium (Jan. 15, 2003)), but it misses the point. The unrebutted thrust of that article was that opportunistic conduct is costly and inefficient, both for the participants in the original arrangement and for society in general, and should be subject to judicial curtailment. Rambus makes no effort to claim that opportunism is in any way efficient or has any legitimate business justification. *See* RB at 106. Instead, it asserts it has not acted opportunistically, and that we can only prove the contrary by showing “that the parties – JEDEC and Rambus – had a clear understanding of the disclosure requirements, and that the rules themselves had failed to capture that understanding.” *Id.* Though the rules did capture that understanding, we easily meet the burden Rambus proposes.



failing to disclose relevant applications, using information and ideas discussed there to perfect its patent rights, and ultimately abusing the advantages it gained from participating in JEDEC to extort royalties. Rambus identifies nothing about this conduct that would promote competition, economic efficiency, or consumer welfare.

So understood, Rambus's legal house of cards collapses. That it is normally legitimate to conceal trade secrets in no way suggests that it was legitimate for Rambus falsely to lead JEDEC and its members to believe that Rambus had agreed to disclose in exchange for participating in JEDEC.<sup>6</sup> Rambus cites no contrary authority, because courts and commentators have long recognized that deceptive and coercive conduct lacks a legitimate business justification, and can therefore be "exclusionary," and prohibited by the antitrust laws, when it leads to market power.<sup>7</sup>

This disposes of the vast bulk of Rambus's legal argument, leaving only four minor points to clarify.

First, although the breach of a so-called "extrinsic" duty does not necessarily violate the antitrust laws, it does not follow that such a breach can never violate the antitrust laws. *See* RB

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<sup>6</sup> This also negates Rambus's attempt to shoehorn itself into the Supreme Court's holding in *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko, LLP* ("*Trinko*"), 124 S.Ct. 872 (2004). *Trinko* held that antitrust does not penalize a monopolist's failure to comply with a statutorily-imposed duty to assist its rivals unless that failure independently violates the antitrust laws. There was no allegation there that the defendant "voluntarily engaged in a course of dealing with its rivals, or would ever have done so absent statutory compulsion." 124 S.Ct. at 880. *Trinko* therefore says nothing about antitrust's role in a situation where an aspiring monopolist voluntarily cooperated with, and then misled, customers and rivals in a successful scheme to monopolize.

<sup>7</sup> *United States v. Microsoft Corp.* ("*Microsoft*"), 253 F.3d 34, 76-79 (D.C. Cir. 2001); Einer Elhauge, *Defining Better Monopolization Standards* ("*Elhauge*"), 56 Stan. L. Rev. 253, 280-82 (2004) (collecting authorities). A case Rambus cites makes the same point. *Brookeside Ambulance Serv., Inc. v. Walker Ambulance Serv., Inc.*, 39 F.3d 1181 (table), No. 93-4135, 1994 WL 592941 at \* 8 (6<sup>th</sup> Cir., Oct. 26, 1994) (giving false information to disadvantage a competitor "could be anticompetitive").

at 109-110. Where – as here – the violation consists of conduct that “does not advance competition on the merits, or does so in an unnecessarily restrictive way” it may indeed be “exclusionary.”<sup>8</sup> And the nature of the duty may – as here – shed light on whether and why the conduct is exclusionary.<sup>9</sup>

Second, antitrust enforcement does not require that “explicit” rules be violated, nor (by necessary implication) that the rules be “clear and unambiguous.” The Supreme Court held in *Allied Tube* that “literal compliance with the rules” of a standards organization does not establish “antitrust validity.” 486 U.S. at 509. A standard-setting participant’s conduct is not to be judged alone on the question of compliance with the rules of the organization, the Court said, but on whether the “hope of procompetitive benefits” from standard-setting had been subverted. *Id.* at 509. The Court reached the same result in an earlier case, *American Society of Mechanical Engineers, Inc. v. Hydrolevel Corp.* (“*Hydrolevel*”), 456 U.S. 556 (1982), affirming liability despite the absence of any violation of a “clear and unambiguous” rule, or indeed, of any rule at all.

Like the ALJ, Rambus claims *Hydrolevel* and *Allied Tube* are limited to Section 1 “conspiracies.” RB at 106-08. This fundamentally misunderstands the decisions. Although *Hydrolevel* and *Allied Tube* were decided under Section 1 of the Sherman Act, liability was predicated on the defendants’ opportunistic behavior in the standards process. Both cases were

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<sup>8</sup> Brief for the United States and the Federal Trade Commission as Amicus Curiae Supporting Petitioner, *Verizon Communications, Inc. v. Trinko*, No. 02-682, at 12 n.3 (U.S., May 27, 2003), available at <http://www.usdoj.gov/atr/cases/f201000/201048.pdf> (“*Trinko* Merits Br.”). Again, Rambus’s cited cases agree. See *Vernon v. Southern California Edison Co.*, 955 F.2d 1361, 1368 (9<sup>th</sup> Cir. 1992) (conduct that creates a contract dispute may also create antitrust liability).

<sup>9</sup> *Trinko* Merits Br. at 12, n.3.

decided under the rule of reason, with analysis similar to that in a Section 2 case. The conduct in both cases, if undertaken outside the context of a standards organization, likely would not have been unlawful because, absent the organization's power, it likely would not have harmed competition. In each case, the conduct violated the antitrust laws precisely because it negated the procompetitive benefits of standard-setting and used the power of the organization to exclude competition for individual gain.<sup>10</sup>

*Hydrolevel* in particular negates Rambus's effort to lump all standard-setting cases into the conspiracy box. The defendant held liable there was the standards organization itself (ASME), which (contrary to Rambus's assertion, RB at 107) did not "conspire" with anyone in any meaningful sense. Indeed, ASME's primary defense was that its processes and name were abused without its knowledge and with no benefit to it by the employees of one of ASME's members to disadvantage another. Accepting those facts as true, the Supreme Court nevertheless held ASME liable because when "the great influence of ASME's reputation is placed at their disposal, the less altruistic of ASME's agents have an opportunity to harm their employers' competitors through manipulation of ASME's codes." 456 U.S. at 571. Similarly, the *Joor* decision – to which Rambus makes no response – held that the mere involvement of a standards organization is enough to supply the concerted conduct element of Section 1.

Third, the question is not whether JEDEC's rules were independently "procompetitive" under the rule of reason, as Rambus claims (RB at 99-104), but whether Rambus's misleading conduct was anticompetitive. If Rambus believed that JEDEC's rules violated the rule of reason, it was free to not join JEDEC, or demand that JEDEC change its rules, or sue JEDEC. It was not free, however, to join JEDEC, ignore the rules and use the standards process to seize monopoly

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<sup>10</sup> See generally JEDEC Brief, SSO Brief.

power.<sup>11</sup>

Fourth, Rambus’s reliance on the “sacrifice” test is inapt. Meeting that test may be sufficient – but is plainly not always necessary – to identify exclusionary conduct.<sup>12</sup> The Supreme Court in *Trinko* pointed out that evidence of sacrifice is useful not because it is required but because of what it may reveal: “a distinctly anticompetitive bent” and “dreams of monopoly.”<sup>13</sup> And courts and commentators have routinely identified conduct that lacks any legitimate business justification but requires little cost and no profit sacrifice as “exclusionary.”<sup>14</sup>

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<sup>11</sup> Rambus’s claim that JEDEC’s rules were anticompetitive is wrong. As rules of an entirely voluntary enterprise, they had no coercive effect, and served to ensure that standards decisions were based on full information – precisely what Rambus sought to prevent. As the amicus briefs and unrebutted authorities cited in our Appeal Brief uniformly explain, the anticompetitive threat here – the danger to innovation, standard-setting as an activity, and consumer welfare – is posed by Rambus’s deception, not JEDEC’s rules.

<sup>12</sup> The test (particularly in the form urged by Rambus) has been criticized as underinclusive, overinclusive, and content-less. *See, e.g.*, Elhauge at 268-94.

<sup>13</sup> *Trinko*, 124 S.Ct. at 880.

<sup>14</sup> *See Conwood Co. v. U.S. Tobacco Co.*, 290 F.3d 768 (6<sup>th</sup> Cir. 2002) (misrepresentations, destroying competitors’ facilities, abuse of trust by misusing category manager position); *Taylor Publ’g Co. v. Jostens, Inc.*, 216 F.3d 465, 480-82 (5<sup>th</sup> Cir. 2000) (tortiously inducing rivals’ employees to violate non-compete clauses); *Caribbean Broadcasting System, Ltd. v. Cable & Wireless PLC*, 148 F.3d 1080 (D.C. Cir. 1998) (misrepresentations, sham objections to competitor’s license applications); *International Travel Arrangers, Inc. v. Western Airlines, Inc.*, 623 F.2d 1255 (8<sup>th</sup> Cir. 1980) (misrepresentations); Elhauge at 280 (“sacrificing short-term profits is normally not even necessary for illicit monopolization;” *see also id.* at 271, 280-94; *Roundtable Discussion: Recent Developments in Section 2*, 18 Antitrust 15, 22 (Fall 2003) (comments of Gary L. Roberts), and at 23 (comments of Aaron Edlin) (“Antitrust Roundtable”); Mark Patterson, *The Sacrifice of Profits in Non-Price Predation*, 18 Antitrust 37, 42 (Fall 2003) (tortious conduct); Kenneth L. Glazer and Brian R. Henry, *Coercive vs. Incentivizing Conduct: A Way Out of the Section 2 Impasse?*, 18 Antitrust 45, 46-48 (Fall 2003) (describing “coercion” scenario with no price reduction by monopolist); Reply Brief for the United States, *United States v. Dentsply Int’l, Inc.*, No. 03-4097 (3<sup>rd</sup> Cir., May 14, 2004) (“*Dentsply* Reply”) at 4-5, available at <http://www.usdoj.gov/atr/cases/f203200/203296.pdf>. One point that emerges from these authorities is that a “profit sacrifice” requirement makes little sense in the context of activities, such as torts, that may not be profit-generating activities in the first place (though they may involve at least some costs).

Indeed, in the *Trinko* Merits Brief on which Rambus relies, the Agencies specifically explained that opportunistic behavior in standard-setting should be evaluated under the general test for exclusionary conduct – that it not further competition on the merits or do so in an unnecessary way – rather than under the “sharper focus” imposed by the sacrifice test.<sup>15</sup>

But this theoretical point is not consequential here. Rambus “sacrificed” under any version of that test. Indeed, though commentators have been unable to agree whether the required “sacrifice” involves simply incurring costs (as every business activity does),<sup>16</sup> or risking long-term loss of goodwill or otherwise jeopardizing some right or interest,<sup>17</sup> or (as Rambus urges) giving up immediate profit for longer-term gratification, Rambus did all three.

Rambus incurred costs in attending JEDEC, concealing its activities, ensuring its patent applications covered the evolving standards, litigating, and otherwise. Its misleading and other conduct sacrificed enormous goodwill, and also ran serious risk that, pursuant to the doctrine of

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<sup>15</sup> *Trinko* Merits Br. at 14-18, and at 14, n.4. The Agencies have recently reemphasized in two briefs that “sacrifice” is not a one-size-fits-all test for exclusionary conduct. First, in the recent *LePage’s* case, the Agencies pointed out that the requirement that anticompetitive behavior be short-term unprofitable is rooted in the careful weighing of the risk of false positives in predatory pricing cases, and should not be blindly extended to all forms of anticompetitive conduct. Brief for the United States as Amicus Curiae, *3M Co. fka Minnesota Mining and Manufacturing Co. v. LePage’s Inc.*, No. 02-1865 (U.S., May 2004) at 8, 11-15 available at <http://www.usdoj.gov/atr/cases/f203900/203900.pdf>. Second, in its reply brief on appeal in *Dentsply*, the Department rejected Dentsply’s argument that “conduct must entail a ‘short-term sacrifice,’” pointing out that in “monopoly maintenance cases like this . . . exclusionary conduct can make a net positive contribution to profit at all times, by preserving ongoing monopoly profits.” *Dentsply* Reply at 3, n.3.

<sup>16</sup> See *Dentsply* Reply at 3-5; Roberts, Antitrust Roundtable at 22; Melamed, Antitrust Roundtable at 22.

<sup>17</sup> See *Microsoft*, 253 F.3d at 76-79 (deceiving purchasers of Microsoft’s Java software development tools, and threatening Intel); *Dentsply* Reply at 5; Patterson, *supra*, at 43;

equitable estoppel, Rambus's patents could be held unenforceable.<sup>18</sup> This represented a cost worth incurring only because it increased the likelihood of securing monopoly profits by reducing the possibility of JEDEC working around Rambus's patents. Tr. 7170-71, 7500-03 (McAfee). Finally, Rambus's delay in enforcing its patents against SDRAM meant that for a period of time Rambus sacrificed significant royalties.<sup>19</sup> Indeed, it was logical for Rambus "at the management level, [to do] an estimate of what revenue [they] were forsaking" by not pursuing SDRAM royalties. CX2105 at 105 (Mooring). Foregoing such revenue meant forsaking profits, which made sense only because it concealed Rambus's patents until after the industry was locked in to the JEDEC standards.

In the final analysis, Rambus makes little serious effort to dispute the law, but instead debates legal points not at issue here. Having laid to rest the few legal issues Rambus raised, we turn now to the facts.<sup>20</sup>

## **B. JEDEC Sought to Prevent Opportunism By Requiring Members' Disclosure**

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<sup>18</sup> See CCF 850-51.

<sup>19</sup> Prior to its assertion of patent claims against JEDEC standard products in 1999-2000, Rambus sought to license its intellectual property only for use in proprietary RDRAM products, but in a few instances (at licensees' insistence) the license also covered other possible uses. See CCF 744-45, 1264-65, 1544-53, 1608, 2456-57. Rambus prior to 2000 did not seek to collect royalties for anything other than proprietary RDRAM products. See CCF 1264-65, 1553. Beginning in 2000 Rambus collected royalties on JEDEC products from Toshiba and others. See CCF 2003-13.

<sup>20</sup> Rambus asserts that *In re Sears Roebuck & Company*, 95 F.T.C. 406 (1980), requires Complaint Counsel to identify each specific error in the ALJ's findings. RB at 4, 16 n.9. Rambus's position is absurd. It ignores the purpose of the *Sears* ruling: issues on appeal must be identified in the initial brief "to permit the timely and orderly consideration of the points in issue," since the appellee would have "no opportunity to answer" an issue first raised in a reply. *Id.* Nothing in *Sears* holds that Complaint Counsel must, in 32,750 words, identify, explain and rebut every individual mistake in 1,665 separate findings. Rather, Complaint Counsel must give Rambus sufficient notice to understand and be heard concerning the issues on appeal. Rambus's brief shows notice was adequate and the purpose of *Sears* was fulfilled.

## **of Patents and Applications Relevant to Ongoing JEDEC Work.**

Rambus does not argue that its conduct was consistent with JEDEC's purposes or members' expectations. Indeed, Complaint Counsel challenged Rambus to identify either (1) a single instance when a JEDEC member attempted to enforce an undisclosed patent against companies practicing a JEDEC standard without provoking immediate and vigorous protests from JEDEC members, or (2) a single witness who testified that concealing patents, applications or ongoing patent work that a member intended to enforce against companies practicing a JEDEC standard was consistent with JEDEC's purposes and procedures. CCAB at 47.

Rambus's response was silence.

Unable to justify its course of conduct, Rambus cobbles together bits and pieces of evidence into abstract arguments divorced from reality. Rambus asks the Commission to find that Rambus had no obligations whatsoever because the policy was "voluntary" not mandatory, applied only to issued patents, and applied only to patents with claims determined to cover the proposed standard. Rambus asks the Commission to disregard the most salient evidence of the policy – the operative documents that informed JEDEC members of it, the statements at each meeting explaining it, JEDEC's statements describing it, and the evidence that JEDEC members, including Rambus, understood it.

In short, Rambus suggests that JEDEC's procedures, meant to prevent members from using patents opportunistically to capture economic power over standards, should be interpreted as entitling Rambus to do precisely that.

### **1. JEDEC's Operative Documents Required Members' Disclosure.**

*Q. . . . My question is, the written words on this document [the 21-I Manual] put an obligation on the participants to disclose pending patent applications that might be related to the work [of*

*JEDEC], yes or no? [Objection omitted.]*

*THE WITNESS: So yes, if this was the valid document, there would be [a] requirement to disclose applications, yes.”*

*CX2054 at 165 (Deposition of David Mooring, Rambus Vice President)*

JEDEC’s purpose, policies and rules were set forth in a series of documents ranging from the general to the specific, including the EIA Legal Guides, the EIA manuals, and the JEDEC 21-I Manual. Created to inform members of their obligations when participating in EIA and JEDEC standard-setting activities, these documents were intended to be interpreted consistently, and should be considered together. Rambus addresses them piecemeal and out of context, hoping that the Commission will ignore them all.

**a) EIA Legal Guides.**

The EIA Legal Guides functioned as the organization’s fundamental organizational document. They required that:

[Standardization programs] shall not be proposed for or indirectly result in . . . restricting competition, giving a competitive advantage to any manufacturer, [or] excluding competitors from the market . . . .

EIA Legal Guides, CX0202 at 6; *see* CCF 315. Standardization efforts “shall be carried on in good faith under policies and procedures which will assure fairness and unrestricted participation.” CX0202 at 6. The Legal Guides lay the foundation for the patent disclosure procedures set forth elsewhere; they also govern in the event of any inadvertent gaps or loopholes in the specific procedures. Tr. 2053-55 (J. Kelly).

Rambus quotes, out of context, a single sentence from the Legal Guides to suggest that standards are proposed or adopted without regard to whether they may involve patents. RB at 9. But the immediately preceding and following sentences make clear that the language is not



intended to govern the conduct of EIA or JEDEC members, but rather is intended to limit EIA's liability if any user is sued for infringement. CX0204 at 4; *see also* JEDEC Brief at 17-18.

Rambus cites the ALJ's unsupported finding that the obligation of "good faith" in Section II of the Legal Guides is directed only to administrators. RB at 10 n.5. This argument defies logic and ignores unrebutted contrary evidence from EIA and JEDEC General Counsel John Kelly.<sup>21</sup> A standard-setting effort cannot operate without an obligation of good faith. *See, e.g.*, SSO Brief at 11, 14-16, 18. There is no logical explanation why EIA would draft extensive basic rules, intended *inter alia* to prevent misconduct by members, but exclude members from their coverage. *See, e.g.*, JEDEC Brief at 18-19. Moreover, such a duty is implied by law. *See* CCAB at 34-35; *Market Street Associates LP v. Frey*, 941 F.2d 588 (7<sup>th</sup> Cir. 1991) (Posner, J.).

**b) EIA Manuals.**

Various EIA manuals formed the second level of operative documents, setting forth procedures that obligated members to disclose relevant patents and applications. These EIA manuals provide that standards requiring use of patented items "should be avoided," JX0053 at 11, *see also* JX0054 at 9, or "should be considered with great care." CX0208 at 19. The EIA manual provided:

[C]ommittees should ensure that no program of standardization shall refer to a product on which there is a known patent unless all the relevant technical information covered by the patent is known to the formulating committee[,] subcommittee, or working group.

CX0208 at 19.

Dismissing these manuals as not "describ[ing] any obligation" or not "using mandatory language" (RB at 10-11), Rambus ignores EIA General Counsel John Kelly's detailed,

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<sup>21</sup> Tr. 1832, 1840; *see generally* Tr. 1840-54; CX0208 at 18.

unambiguous and uncontested testimony that these statements do reflect an obligation to disclose relevant patents and applications and, indeed, could not be implemented without disclosure. Tr. 1866, 1869-70, 1905-06 (J. Kelly); *see also* JEDEC Brief at 23. He confirmed that these provisions require members to inform the standards committee of relevant technical information about any patent<sup>22</sup> they know of relating to a standardization program. Tr. 1905-06; *see also* Tr. 1898-99; JEDEC Brief at 11, 28-29.

**c) JEDEC 21-I Manual.**

*Q And how did you come to get that copy [of the 21-I Manual] in 1995?*

*A I had made a request to be given whatever kind of manual they must have had there for members that outlined what the patent policy was.”*

*CX2104 at 852 (Deposition Testimony of Richard Crisp).*

The 21-I Manual – the third level of operative document – described the disclosure obligation in specific terms:

The Chairperson . . . must call to the attention of all those present the requirements contained in the EIA Legal Guidelines, and call attention to the obligation of all participants to inform the meeting of any knowledge they may have of any patents, or pending patents, that might be involved in the work they are undertaking.

CX0208 at 19. Multiple witnesses confirmed that this passage was intended specifically to set forth members’ disclosure obligations, and that it meant precisely what it said. Tr. 318-19 (Rhoden); Tr. 795-96 (Williams); Tr. 2429-31 (G. Kelley).

Rambus doesn’t even attempt to contest the 21-I Manual’s clear language. Its sole

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<sup>22</sup> EIA and JEDEC used the term “patent” to refer to both issued patents and patent applications. Tr. 1893 (J. Kelly); *see also* Tr. 1896-98 (J. Kelly); Tr. 314-18 (Rhoden); Tr. 2406-07 (G. Kelley); CX2112 at 148-49 (Mooring).

argument is that the 21-I Manual could not *create* a new legal obligation where none existed before because, Rambus claims, a committee known as EDEC had not adopted it. RB at 14-16.

Rambus's argument is flawed. First, the 21-I Manual did not create any new obligation, but rather simply described the existing disclosure obligation. Tr. 2415-16 (G. Kelley); Tr. 1920-28 (J. Kelly); CX2057 at 177-78 (Meyer); Tr. 791-92 (Williams).

Second, the 21-I Manual was properly adopted. Relying exclusively on a single leading question-and-answer at trial, Rambus argues that the 21-I Manual needed EDEC's approval. RB at 15. In fact, the proper approval process was followed: Section 4.4 of the EIA EP-7-A Manual makes clear that, at that time, the preface of every document must indicate approval by either EDEC or the JEDEC Council. CX207A at 10. The 21-I Manual preface properly indicates that it was "formulated under the cognizance of the JEDEC Solid State Products Engineering Council." CX0208 at 5. Indeed, the 21-H Manual set forth the specific procedure for amending the manual: favorable vote at two Council meetings and EIA legal approval. CX205 at 15. This procedure was followed and all requirements were fulfilled. CX0054 at 7 (first Council vote); CX0055 at 2 (second Council vote); Tr. 2423-29 (G. Kelley describing Council review and approval); Tr. 1925 (J. Kelly on approval by the EIA Legal Department).

Third, technicalities of its adoption aside, the 21-I Manual was JEDEC's definitive contemporaneous statement of the disclosure policy. CCF 408-18. Members confirm that the 21-I Manual stated the policy's substance. Tr. 312-13, 318-22 (Rhoden); Tr. 1340, 1349 (Sussman); Tr. 1702-04 (Landgraf); Tr. 1925 (J. Kelly); Tr. 2385, 2408-09 (G. Kelley). The record confirms (and Rambus virtually concedes) that JEDEC members referred to the 21-I Manual for guidance with respect to the disclosure policy. Indeed, when Richard Crisp asked for guidance concerning the JEDEC patent policy, he was given a copy of the 21-I Manual.

CX2104 at 851-52, 923 (Crisp).

**d) Other Documentation Directed to Members.**

The final level of operative documents, used by JEDEC committees in carrying out their standard-setting work, included:

- the meeting sign-in sheet<sup>23</sup> (CX0306; Tr. 342-45 (Rhoden); Tr. 1350-51 (Sussman));
- the Townsend memos (CX0042A at 7; CX0336 at 1; CX0342 at 1; CX0347 at 2; JX0018 at 14; JX0019 at 17); and
- the ballots (CX0252A at 2; CX0253 at 2; CX0254 at 2; CX0255 at 2).

Rambus's sole response to the Townsend memoranda is that, "Mr. Townsend never addressed his memorandum to Rambus." RB at 23. This is true, for a very simple reason. He addressed memoranda to holders of relevant disclosed patents. Tr. 903 (Williams). He never sent a memorandum to Rambus because Rambus successfully concealed its relevant applications. But Rambus was well aware of the content of Mr. Townsend's memoranda, as they were displayed at meetings and included in the JEDEC minutes. CCF 367-372.

In sum, Rambus marshals no persuasive evidence to counter the operative documents JEDEC and EIA created to inform members of their responsibilities. Those documents (1) prohibited members from using JEDEC standard-setting to exclude others from the market or obtain an individual competitive advantage, (2) obligated members to disclose patents and applications relevant to on-going JEDEC work, and (3) required members to fulfill these and

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<sup>23</sup> After reminding members that, "Subjects involving patentable or patented items shall conform to EIA policy," the sign-in sheets instructed members, "Consult the EIA General Counsel about any doubtful question." CX0306 at 1. There is a distinct parallel with 16 C.F.R. § 2.41(d), which invites respondents subject to a Commission order to request advice from the Commission regarding interpretation of the order. A district court recently ruled that a respondent's failure to seek clarification of an unclear order constituted bad faith; the respondent "had an obligation to do more than see how close to the sun it could fly with impunity." *United States v. Boston Scientific Corp.*, 253 F.Supp.2d 85, 100 (D. Mass. 2003).

other responsibilities in good faith.

**2. JEDEC Confirms Its Disclosure Policy Obligated Members to Disclose Patents and Applications Relevant to Ongoing JEDEC Work.**

JEDEC has confirmed, both in its Amicus Curiae Brief and through the testimony of its President and General Counsel John Kelly, that its disclosure policy required members to disclose both issued patents and pending applications related to ongoing JEDEC work. *See* JEDEC Brief at 9-13. Rambus ignores Mr. Kelly’s testimony, but offers no reason why the Commission should do so.<sup>24</sup> Mr. Kelly’s testimony is centrally important, since he had ultimate authority regarding interpretation of EIA and JEDEC rules, including the disclosure policy. Tr. 1816-17, 1822, 1857-58, 1937-38; CCF 226.

Mr. Kelly testified that “JEDEC standards are open in the sense that they are not subject to restrictive intellectual property rights.” Tr. 1776-77; *see also* Tr. 1898-99 (“EIA does not endorse a standard that contains hidden IP”). Open standards “ensure[] that the end product of the standards process won’t be subject to unfair competition or misuse by a particular company to enhance its market power.” Tr. 1780-82; *see also* Tr. 1843-44. He explained that JEDEC “rel[ies] on the participants in the process to surface patent issues to our attention,” as JEDEC is “not in a position to go out and find out . . . what intellectual property may be there.” Tr. 1836-37. The JEDEC patent policy “basically requires an early disclosure of intellectual property; that is, patents or patent applications that are or may be related to the work of a standard-setting committee.” Tr. 1837-38; *see also* Tr. 1869-70. The disclosure obligation arises from on-going JEDEC work, and is “not tied to a formal step in the [standard-setting] process.” Tr. 1983-84;

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<sup>24</sup> JEDEC, active for 45 years, currently has 250 member companies participating in fifty standard-setting committees. JEDEC Brief at 1-2. There is every reason to expect that its position is carefully considered.

*see also* Tr. 1985 (“[I]f [a member’s] present interpretation of their patent [application] was broad enough to support future amendments . . . that triggers the obligation to disclose”); Tr. 1995-96.

Mr. Kelly explained that “the entire process depends upon the disclosure of relevant IP information.” Tr. 1906; *see also* Tr. 1912 (“the disclosure requirement goes right to the heart of the open standards process.”). The greatest concern was the so-called “snake in the grass” scenario, where “there is nondisclosure of relevant IP with an intent to misrepresent, and then the patent owner at some subsequent date, once the technology is included in the standard” asserts previously undisclosed claims. Tr. 2020. Mr. Kelly stressed the importance of members’ obligation to participate in good faith:

[B]ad faith undermines the confidence of everyone in the process . . . [it] affects the outcome of the process, and the standard is not open, and if the standard is not open . . . it can impact the entire supply chain and the consumer and the public good.

Tr. 1841-42; *see also* Tr. 1843-44. Mr. Kelly testified that, pursuant to the duty of good faith, members must comply with the patent policy “not just in terms of its written letter, but also in terms of the spirit of the patent policy.” Tr. 2053-54. The duty of good faith serves to fill any unintended loopholes in the disclosure policy. Tr. 2054-55; *see also* Tr. 1846-48 (explaining specific conduct that did not clearly violate disclosure policy, but violated good faith obligation).

### **3. JEDEC Members Understood the Obligation to Disclose Patents and Applications Relevant to Ongoing JEDEC Work.**

*Q. And one of the ways you learned that [there was a patent policy at JEDEC] is because at every meeting you attended of the 42.3 subcommittee, Jim Townsend started the meeting with a discussion of the patent policy. Isn’t that right?*

A. *I believe that was generally true.*

*Tr. 2949 (Testimony of Richard Crisp)*

*Q And the draft proposed language [for the JEDEC Manual] adds [the] obligation to disclose pending patent applications, right?*

A *Yes.*

*Q And that was discussed at this meeting, December 9<sup>th</sup> and 10<sup>th</sup> of 1992, at JEDEC; right? [Objection omitted.]*

*THE WITNESS: Yes.*

*CX2055 at 96-97 (Deposition of David Mooring, Rambus Vice President)*

Jim Townsend, Chairman of the JC-42 Committee, began every meeting with a discussion of the JEDEC patent policy. Though Mr. Townsend is deceased, his legacy lives on in testimony from multiple JC-42.3 members who heard his presentations. The overwhelming weight of this testimony confirms that JEDEC members were expected to disclose patents and applications that they knew were relevant to JEDEC's work.

Rambus's tortured interpretation of its disclosure obligations runs counter to the testimony of almost every witness to testify on the subject. Only Rambus's witness Alan Grossmeier of Cray Research can fairly be said to have supported some of Rambus's positions. The Commission cannot adopt Rambus's position unless it rejects not only the position of JEDEC presented in its brief and the testimony of President and General Counsel John Kelly, but also the testimony of twelve JEDEC members:

**Gordon Kelley** of IBM testified that "JEDEC had a policy on patents and in that policy the first requirement was to avoid patents." Tr. 2396. Open standards required disclosure of patents "[s]o that we could avoid them if possible." Tr. 2395, 2393. The JEDEC disclosure policy required members "to disclose patent[s] or material that would probably become a patent

to the committee so that the committee had an opportunity in the creation of its standards to avoid the patents when possible.” Tr. 2406. The policy applied to patents, “patent applications that were being worked on with the patent office, and items that were probably going to become patents.” Tr. 2406-07.<sup>25</sup>

**Desi Rhoden**, then of HP and VLSI, testified that “the fundamental premise inside JEDEC is open standardization, and open standardization necessarily means standards that are developed that are either free of intellectual property or at least all intellectual property is known at the time of creation of the standard . . .” Tr. 536; *see also* 301-02. He summarized the disclosure policy: “[E]ssentially if you have IP, IP that may relate to any of the discussions that are going on inside JEDEC, that you are required to disclose that IP to the people who are participating.” Tr. 307. Members had “an obligation to disclose everything that is in the patent process” (Tr. 317-20), “if the intellectual property has any relevance to the work that’s going on” in JEDEC. Tr. 321-22, *see also* 315-16. JEDEC did not expect members “to actually try to do a determination of whether it applies or doesn’t apply. We’re saying if it’s related, in the same general area, then you must disclose it. You are obligated to disclose it.” Tr. 321-22.

**Howard Sussman**, of NEC and Sanyo, described the JEDEC patent policy: “Basically, if you have IP, you are to inform the group of that IP.” Tr. 1333. The policy applied to “[i]ssued patents, patent applications, and . . . if you were about to apply for a patent, all of the above, all inclusive.” Tr. 1333-34. If it was “a gray situation, you weren’t sure whether or not the IP or the patent would apply” to the ongoing JEDEC work, “I have an obligation to tell you that it exists.”

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<sup>25</sup> Mr. Kelley also testified that, if a company observed a presentation while that company was a member and then chose to withdraw before the matter came to ballot, the member's withdrawal would not relieve it of its obligation to disclose relevant patents or applications. Tr. 2758.



Tr. 1346; *see also* 1331-32. The obligation to disclose was triggered by any discussion of a specific technology in JEDEC. Tr. 1343.

**Brett Williams** of Micron explained: “[I]f somebody had a patent or pending patent based upon the work that was being discussed at JEDEC, that there needed to be disclosure of sufficient information so that the council or the committee could determine whether or not what was being discussed was actually implied in the patent.” Tr. 771. He added, “As soon as you knew that there was a possible patent that could apply to what was being discussed, you were to bring that forward” so that the committee could investigate licensing terms or “tr[y] to design around it.” Tr. 771-72. The policy applied to “all patented items, no matter what stage of process it was in. If you believe you have some invention that is covered – that applies to what is being discussed at JEDEC, if there’s a reasonable possibility that it applies, then you need to bring that up to the committee.” Tr. 788-89. He testified that Chairman Townsend and the JEDEC board emphasized the policy “so that the industry was not held hostage again like it was under the WANG case.” Tr. 787.

**Thomas Landgraf** of HP testified that the purpose of the JEDEC disclosure policy was to “make sure that standards do not have any conflicts down the road with their potential use. The worst thing to have is a standard and products made according to that standard and then later you find an infringement, and . . . you can’t produce a system because you’ve got an infringing component in there . . . .” Tr. 1694. The policy “was that if you as a member of JEDEC knew of a patent or application . . . that would potentially be impacting the standard or proposed standard, you were to disclose it to the committee for . . . consideration so the committee could decide to either modify the standard proposal . . . so that it did not infringe,” or determine whether the patent holder would license on RAND terms. Tr. 1693-94, 1695-96. “[I]f you are going to

participate in an open standard formulation body, you need to disclose everything that is applicable or potentially impacting the standards that you are going to adopt,” and “the expectation was that members would disclose anything they’re working on that they potentially wanted to protect with patents down the road.” Tr. 1698-99.

**Willibald Meyer** of Siemens (now Infineon) testified that the JEDEC disclosure policy provided that “the holders of a patent or an application should make the committee aware . . . [of] the application [or] the patent which they held or had filed was in relationship to the work in JEDEC that we were doing.” CX2089 at 142-143. Siemens disclosed patents to JEDEC because the patents were “sufficiently close that [they] could have covered” the JEDEC work. CX2057 at 203-204. Rambus should have disclosed to JEDEC when “it had become clear that the work [on its pending patent applications] . . . became close or overlapping with to the work in JEDEC which was also a process going on in parallel.” CX2058 at 368.

**Samuel Calvin** of Intel (now retired) described the JEDEC disclosure policy as providing that “anyone who was aware of patented . . . items, that could affect policy, had an obligation to bring that awareness to the group.” Tr. 1003-04. The purpose of the policy was to permit JEDEC “to understand the [e]ffect of patents upon things that you were standardizing.” Tr. 1001-02. If JEDEC work evolved over time, “as you began to realize that the direction the standard was going could be affected by [your company’s patent applications], you would have a similar obligation [to disclose].” Tr. 1011-12; *see also* 1009-10.

**Mark Kellogg** of IBM testified that “Gordon [Kelley, the Subcommittee Chairman,] made it clear that IBM and in fact that any company was obligated to disclose patent activity.” Tr. 5024. He explained: “Patent activity to me is intent to file, file, the actual filing itself or the issuance of a patent.” Tr. 5032. IBM disclosed not only patents and applications, but also

“preapps.” “That’s a term I use for disclosing plans to apply for a patent. In other words, the application hasn’t yet been submitted to the patent office.” Tr. 5023; *see also* Tr. 5030-36. Mr. Kellogg also explained the obligation to provide “a reference for the patent” to “allow us to comprehend the implications of the patent.” Tr. 5058-60.<sup>26</sup>

**Terry Lee** of Micron explained that JEDEC’s “general goal was to develop a standard that was free from encumbrance from patents.” Tr. 6598. JEDEC’s policy was “to try to avoid the use of patents, when possible, in defining a standard.” Tr. 6595-96. JEDEC rules contained “a requirement to disclose patents or patent applications in progress to the committee if the work that they were doing may relate or if the patent may relate to the work the committee was doing.” Tr. 6595. The purpose of the disclosure rule “was to be able to allow the committee to avoid the use of patents and incorporating them in the standard.” Tr. 6598. If a company failed to disclose a patent related to the work of JEDEC, and if that technology was adopted into a standard, the company “would forego their right to enforce the patent against the standard.” Tr. 6599.

**Joel Karp** of Samsung (before joining Rambus as Senior Vice President of Intellectual Property) signed an affidavit stating: “My understanding of the EIA patent policy is that standards promulgated by standard-setting groups are ‘open’ standards, unless the holder of an intellectual property right has previously disclosed during the standard-setting process its property interest . . . . It is contrary to industry practice and understanding for an intellectual property owner to remain silent during the standard-setting process – and then after a standard has been adopted and implemented – later attempt to assert that its intellectual property covers

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<sup>26</sup> “JUDGE McGUIRE: . . . if [the disclosers] haven't also disclosed the implications of the patent, have they I guess adequately then disclosed the patent under the patent policy? THE WITNESS: No. . . . Within the context of the patent policy at JEDEC, disclosure of a number I don't believe meets the patent policy. If the number is disclosed not in any context of anything else.” Tr. 5058-60.

the standard.” CX2957 at 2.

Rambus introduced deposition testimony of **Samuel Chen** of Mitsubishi. Mr. Chen agreed with the leading questions framed by Rambus’s counsel that “the JEDEC patent policy . . . encourages members to disclose patent applications that relate to a standard” and “disclosure of a patent application that relates to a standard goes one step beyond the requirements of the policy.” CX3135 at 15-16. But Mr. Chen testified in his own words that the JEDEC policy required the disclosure of both patents and applications if the representative was aware of them. CX3135 at 102. The purpose was to “mak[e] known to all the members . . . all the technologies of the patent” so they could consider alternate solutions. CX3135 at 104. When asked about disclosing plans to amend a pending patent application to cover ongoing JEDEC work, he testified, “We would disclose if we know this is a patent that will directly relate to the standard . . .” CX3135 at 103-104. He understood that disclosure should be made when awareness of the issue arose, “[b]ecause we are not trying to take advantage of JEDEC discussion. That’s a good procedure of JEDEC member. I should [disclose] if I’m aware of it.” CX3135 at 110.

Rambus introduced testimony of **James McGrath** of Molex. He attended meetings of the JC-11 committee and sometimes the JC-42.5 committee, but generally attended only the tail end of the JC-42.3 committee meetings and generally missed Mr. Townsend’s patent presentations. Tr. 9243-44, 9268-69. He testified that the JEDEC policy was intended to “somewhat level the playing field” between a patent holder, who could restrict competition or exclude others, and other JEDEC members. Tr. 9274-75. He stated that there was an expectation among JEDEC members that patents would be disclosed. “There was [also], I think, an expectation that patent applications would be disclosed. I don’t recall that that was done very frequently though.” Tr. 9245. He testified that, “From time to time somebody would mention

that they had a patent application, yes” and noted that Mr. Townsend’s patent tracking list contained items listed as patent applications. Tr. 9246-47. Mr. McGrath also noted the importance of the good faith requirement. Tr. 9272-73 (“JUDGE McGUIRE: But also this obligation to act in good faith, did that incorporate the idea of disclosing patent applications as they were being developed? THE WITNESS: Yes, it would.”).<sup>27</sup>

Rambus introduced testimony of **Alan Grossmeier** of Cray Research. Although Mr. Grossmeier testified that he thought the disclosure policy “was pretty vague” and that he did not expect members to disclose patent applications (Tr. 10947), he admitted that he was “not real concerned about patents and patentable products and patent policies in that time frame” (Tr. 10964), that other individuals at JEDEC were more knowledgeable than he was about the requirements of the JEDEC patent policy<sup>28</sup> (Tr. 10957), and he “missed a lot of meetings” in the early 1990’s. Tr. 10973-74. He understood that JEDEC aimed to create open standards, and it had a patent disclosure policy between 1991 and 1996. Tr. 10953. He described his understanding of the policy, “if a patent holder had a patent that in any way was applicable to a proposed standard, they were to disclose that at the time of balloting within the committee.” Tr. 10945.<sup>29</sup>

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<sup>27</sup> Mr. McGrath explained two good faith scenarios: a presenter should be aware of and disclose his or her company’s relevant patents at the time of the presentation; and an attendee listening to somebody else’s presentation might not be aware of his or her company’s relevant patents, and wouldn’t disclose until the person is sure that the JEDEC work and the patents under development “are going to cross at some point.” Tr. 9272-74.

<sup>28</sup> Mr. Grossmeier was absent when the proposed JEDEC manual was presented to the JC-42.3 Committee in December 1992, the Quad CAS incident was discussed in December 1993 and March 1994 meetings (including the unanimous vote when members stated that the policy was clear). Tr. 10961, 10963-65, 10974-75, 10977-79; *see also* Tr. 10972-73.

<sup>29</sup> Rambus succeeded in excluding much of the deposition testimony of Mr. Reese Brown, a retired former consultant to JEDEC. The remaining portions of Mr. Brown’s testimony

In addition to individuals who attended JEDEC meetings, others, including senior industry leaders responsible for strategic company decisions, also understood JEDEC's purposes and policies. **Andreas Bechtolsheim**, a founder of Sun Microsystems, understood that JEDEC developed open standards and sought to "choose technologies . . . that were not encumbered by proprietary patents or royalty claims." Tr. 5781-82, 5785-86. An essential element "is having matters disclosed at the time the standards groups make certain decisions so that the participants are fully aware of the implication of making such a choice." Tr. 5897.

**Steven Appleton**, CEO of Micron, understood that the purpose of JEDEC "is to develop an open standard that companies and customers would have access to" in developing their products. Tr. 6327-28. Later enforcement of undisclosed intellectual property against a JEDEC standard "destroys the whole process of developing an open standard." Tr. 6331-32, 6328-30.

**Kye Hwan Oh**, formerly Senior Executive Vice President in charge of semiconductor operations at Hynix, testified that, based on attendance at JEDEC meetings, Hynix expected JEDEC standards to be open to all users and free of royalties. CX2107 at 137-138, 160; *see also* CX2108 at 230, 294.

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are contradictory. CX2076 at 80-81; CX2110 at 63. Rambus also called as witnesses Mr. Farhad Tabrizi of Hitachi and Hyundai and Betty Prince of Texas Instruments, later an independent consultant, but carefully avoided asking them about the JEDEC disclosure policy and objected to any attempts by Complaint Counsel to do so. Tr. 9119-20, 9122-24; *see also* 9125-26.

**4. Rambus Representatives Understood Their Obligation to Disclose Patents and Applications Relating to Ongoing JEDEC Work.**

*Q . . . Based on your reading of [the] 21-I [Manual], did you come to some understanding of what the written patent policy was of JEDEC?*

*. . .*

*A Well, they wanted to know about both patents and patent applications that might relate to the works that were going on within JEDEC.*

*CX2104 at 852-53 (Deposition Testimony of Richard Crisp)*

Rambus representatives shared the understanding of the JEDEC patent policy reflected in the testimony of JEDEC members. As Richard Crisp said, “[t]he job of JEDEC is to create standards which steer clear of patents which must be used to be in compliance with the standard whenever possible.” CX0903 at 2.<sup>30</sup> From the outset, Rambus representatives observed Mr. Townsend’s presentations and saw members disclosing both patents and applications. *See* CX0672 (Garrett e-mail: “Fujitsu indicated that they do have patents applied for . . . !!!”); CX0685 (Mooring e-mail: “IBM [said] some ‘voting’ JEDEC attendees have patents pending on SDRAMs that they have not made the committee aware of. They will come to the next meeting with a list of the offenders.”); CX2092 at 63-64 (Crisp). Rambus Vice President David Mooring and Mr. Crisp observed Mr. Townsend displaying and describing the new language being added to the JEDEC Manual.

*Q And what [the draft 21-I Manual] said and what [Mr. Townsend] said to everyone in the committee is that the policy applied equally to patent applications as it did to patents, right?*

*A I think he said that. I don’t remember it very clearly, but I think*

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<sup>30</sup> Mr. Crisp acknowledged it was “reasonable” that, if one wanted to avoid forcing users of a JEDEC standard to pay royalties, the disclosure policy needed to include both patents as well as pending applications. CX2086 at 149. And he acknowledged that the 21-I Manual specifically stated that patent applications had to be disclosed. CX2092 at 62.

he said that.

CX2092 at 168 (Crisp); *see also id.* at 62; CX2055 at 96-97 (Mooring). Mr. Crisp admitted that he was “pretty well aware of the patent policy at JEDEC” in 1992-93. CX2092 at 56. Rambus representatives witnessed the sharp reaction of other members to the rare instances where a company failed to disclose properly. CX0711 at 1 (Crisp: “TI was chastized for not informing JEDEC that it had a 1987 patent on quad CAS devices”); *id.* at 187 (Crisp: “Hitachi stated that they had a patent relating to it. This created a big ruckus.”); CCAB at 44-47.

Rambus representatives recognized that they too had disclosure obligations. CX0868 (Crisp e-mail: “I think we should have a long hard look at our IP and if there is a problem, I believe we should tell JEDEC that there is a problem. Other opinions?”). Indeed, the Chairman of the JC-42.3 Committee twice asked Richard Crisp specifically about Rambus patents relating to ongoing JEDEC work. CX0673; CX2089 at 130-31, 136-37 (Meyer); CX0711 at 73; CX794 at 4; Tr. 3266-68 (Crisp); CCF 902-909, 1041-48, 1062-68.

**5. The JEDEC Disclosure Rules Served the Procompetitive Purpose of Ensuring Full Knowledge About Potential Patents Before Adoption of Its Standards.**

*Q. Don't they also want to know . . . whether it will be encumbered by patents so that they can decide as part of the process whether to go with that technological route or some other alternative? [Objection omitted.]*

*THE WITNESS: Yes. An objective of . . . [JEDEC] is to understand to the best of their ability whether there are patents that read on the standard being set.*

*CX2054 at 103 (Deposition of David Mooring, Rambus Vice President)*

*Q. Would you agree that a standard-setting body has an interest to the extent possible in setting standards that don't require the payment of royalties to intellectual property holders?*



*A Well, I would think that they would be interested in doing that if it's possible to do it.*

*CX2086 at 147 (Deposition of Richard Crisp).*

JEDEC's ultimate goal was to adopt open standards free of unknown patents and available to all industry participants on an equal basis. *See* CX0202 at 6; CCAB at 41-42, 57. But Rambus claims that JEDEC's purpose was only to assure RAND commitments from technology owners. RB at 20-22. Based on a few instances when JEDEC decided to adopt certain patented technologies after a RAND commitment was provided, Rambus asks the Commission to assume that JEDEC members would have adopted every technology subject to any patent held by any company, subject only to a RAND commitment and without ever conducting prior license negotiations.

None of Rambus's assumptions is correct. JEDEC did not adopt every patented technology. Rather, it examined each individually to determine whether technical reasons justified including it in the standard. For some, members concluded that selection was justified; for others, they concluded it was not. Tr. 5046-49 (Kellogg: Cypress, Kentron, Hyundai, and IBM technologies not adopted despite RAND offer); CX3135 at 104-06 (Chen: Mitsubishi proposals not adopted after mention of patents). JEDEC also considered the nature of the patent in question, as it had less concern about implementation patents than blocking patents. CX0903 at 2.

JEDEC also considered each individual RAND commitment. A RAND commitment from a manufacturing company with extensive industry cross-licenses was in most cases functionally equivalent to a 0% royalty rate. On the other hand, a RAND commitment from a pure technology company could result in substantial cash royalties and was much less likely to

be acceptable. Tr. 6716-17 (Lee); JX0007 at 5, 52. Even if JEDEC members were willing to consider technologies subject to Rambus patent rights based on RAND commitments, the evidence indicates that at least some members were likely to insist on prior negotiations. CCAB at 102.

Rambus also argues that any rule requiring disclosure is anticompetitive because the same purpose can be accomplished by requiring all members to provide blanket RAND commitments. RB at 99-104. Rambus's argument misses the mark. Although not perfect, a policy requiring disclosure of all known patents and applications reduces substantially the risk of hold-up. Rambus's proposed alternative of compulsory blanket RAND licensing has been roundly rejected not only by standard-setting organizations but also by the U.S. government. RX0669 at 3 ("ANSI and TIA joined the U.S. Government in opposing an effort by the European Telecommunications Standards Institute to force compulsory licensing on an extraterritorial basis."). *See also* ANSI's statement that ETSI policy, which "required compulsory as opposed to voluntary licensing" as a condition of membership, was "coercive."<sup>31</sup> The popularity of disclosure policies among standard-setting organizations and the rejection of compulsory licensing reflect the considered judgment of many organizations that disclosure policies represent the best and lowest-cost means to reduce risk of hold-up. Mark Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 Cal. L. Rev. 1889 at 1902-06 (2002); SSO Brief at 16, 18-19.

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<sup>31</sup> Statement of Amy Marasco, ANSI Vice-President and General Counsel, before the Federal Trade Commission (Dec. 1, 1995) ("Marasco 1995 Statement") at 6, available at <http://www.ftc.gov/opp/global/marasco.htm>.

**6. Rambus’s Arguments, Based on a Handful of Documents and Snippets of Testimony, Are Overwhelmed by the Weight of the Evidence.**

**a) ANSI Policy.**

Rambus argues, based on ANSI Guidelines, that it had no disclosure obligations at JEDEC. RB at 11-12. But ANSI’s Guidelines represent only “suggestions” to “identify possible procedures that a standards developer may wish to adopt, either in whole or in part.” CX0355 at 3. They leave considerable latitude to SSOs to create procedures appropriate to the particular organization, its members, and the industry in which it operates. *See generally id.* at 3-7.<sup>32</sup> JEDEC’s procedures, not ANSI’s, govern JEDEC. Tr. 1957-59 (J. Kelly).

Second, Rambus misinterprets ANSI’s position. ANSI recognized that “early disclosure of patents is likely to enhance the efficiency of the [standard-setting] process” and “provides participants the greatest opportunity to evaluate the propriety of standardizing the patented technology” and negotiate licenses before the standards are set. CX0355 at 5. A standards organization’s objective is “to obtain early disclosure concerning the existence of patents, where known.” *Id.* ANSI said standards organizations may want to encourage the disclosure of pending patent applications, without necessarily requiring members to conduct a patent search. *Id.* at 6. Even under its minimum criteria, ANSI supports antitrust liability “when a participant in the standards development process intentionally and deliberately fails to disclose that his or her organization holds a patent relating to the standard in question in an attempt to gain an unfair

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<sup>32</sup> *See also* Statement of Amy Marasco, ANSI Vice-President and General Counsel, FTC and United States Department of Justice Joint Hearings Regarding Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy (April 18, 2002) (“Marasco 2002 Statement”) at 15, available at <http://www.ftc.gov/opp/intellect/020418marasco.pdf>.

competitive advantage.”<sup>33</sup> Marasco 1995 Statement at 5. *Accord, id.* at 6 (“in the case of deliberate misconduct, the FTC can intervene”); *See also* Marasco 2002 Statement at 14, 15 (“intentional abuses of the standards-setting process are not to be tolerated”).

**b) Comment in 1989 Minutes.**

Rambus relies on an out-of-context comment from the September 1989 meeting of a different committee – the JC-42.1 Committee – to the effect that disclosure of patents would not “be checked to see who said what.” RB at 21; CX0003 at 6. The concern discussed at that meeting, however, was whether large companies (which could not search their entire portfolios for relevant patents) should be liable for good faith mistakes. CX0003 at 6. Nothing in this discussion suggests that a member could deliberately conceal known patents. Indeed, Rambus’s strained position cannot be reconciled with the eruption that occurred in 1993-94 following TI’s failure to disclose patents relating to Quad CAS. CCF 424-32; CX0711 at 1, 16; CX2384.

**c) 1994 Memorandum Regarding ETSI Policy.**

Rambus’s unsupported interpretation of an informal internal memorandum prepared by Ken McGhee, the secretary of JEDEC (RB at 17-18), is disingenuous. The document involved “ETSI Policy,” a different organization that required compulsory, royalty-free licensing of patents necessary to practice ETSI standards. RX0486; *see also* Marasco 1995 Statement at 6 (ETSI policy “required compulsory as opposed to voluntary licensing”). Again, the concern was that companies were afraid of providing assurances that required a portfolio search, which in

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<sup>33</sup> Statement of Amy A. Marasco, ANSI Vice-President and General Counsel, before the Federal Trade Commission (Dec. 1, 1995) (“Marasco 1995 Statement”) at 5, available at <http://www.ftc.gov/opp/global/marasco.htm>. *Accord, id.* at 6 (“in the case of deliberate misconduct, the FTC can intervene”).

a large company can be costly, time-consuming, and potentially inaccurate.<sup>34</sup>

**d) EIA/TIA-FTC Correspondence.**

Rambus relies heavily (RB at 12-14) on a January 1996 letter to the Commission prepared jointly on behalf of EIA and a related but separate organization. RX0669.<sup>35</sup> Rambus ignores both Mr. Kelly's testimony about the letter (Tr. 2013-20) and the letter's context. The letter urged the Commission not to extend liability to cases involving a negligent failure to disclose or to impose any affirmative duty on companies to perform patent searches. RX0669 at 3-4. The letter supported antitrust liability, however, for monopolization in "cases involving actual knowledge of the existence of a patent and intentional failure to disclose the patent interest." *Id.* at 3; Tr. 2013-20 (J. Kelly).

**e) Gordon Kelley Statement.**

Rambus's reliance on statements of Gordon Kelley that, it says, indicate that IBM would not comply with the JEDEC disclosure obligation (RB at 17) is contradicted by IBM's disclosure of numerous patents, applications, and even its intent to file applications, as well as contemporaneous statements of Mr. Kelley regarding the importance of disclosure. *E.g.*, CX0685; JX0019 at 4-5; CX2384; Tr. 2435-36, 2438, 2474-75, 2479-80 (G. Kelley). In fact, Mr. Kelley stated that, because of its sheer size and number of research locations, IBM could not provide a comprehensive list of all patents or applications relating to JEDEC's work. He committed to JEDEC, however, that he would disclose any relevant patent or application of which he, or any other IBM attendee was aware, and would investigate and respond to any

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<sup>34</sup> Rambus chose not to call Mr. McGhee to testify about the document.

<sup>35</sup> Rambus also cites to a return letter to EIA/TIA from Commission Secretary Don Clark, and a subsequent cover memo that repeated the language of the EIA/TIA letter, but have no independent probative value.

questions raised by others. Tr. 2449-52, 2455-58, 2471-73 (G. Kelley). Contemporaneous documentation and testimony from other witnesses confirms Mr. Kelley's account. CX2375 at 2 (Kellogg notes of March 1994 JC-42.3 meeting: "IBM: Not full IBM position, IBM agrees to warn of potential applicable patents"); Tr. 589-90 (Rhoden: "I heard . . . IBM make the statement . . . the company was so large, they could not guarantee that they would bring all patents to the attention of the committee"); Tr. 5022-23, 5024-26 (Kellogg: "Gordon was indicating that IBM would disclose patent activity that the participating members were aware of. . . . [W]e felt [it was] impossible for us . . . to study/evaluate the entire patent portfolio from IBM. So Gordon more than once disclosed the fact that we would not research [for] patents"); Tr. 10983-84 (Grossmeier: IBM's concern was that it was so large, the representatives couldn't search the whole company and could not bring JEDEC a list of all relevant patents and applications).

**f) 2000 Board Minutes.**

Rambus relies on an e-mail from Ken McGhee and a draft set of minutes from a February 2000 JEDEC Board of Directors meeting to assert that patent disclosure cannot be required and Micron's disclosure of a patent application had gone a step beyond the patent policy. RB at 18-19. Rambus deliberately omits the context of the documents. The discussion involved Micron's issuance of a follow-up letter confirming a previous disclosure of a patent application, and whether Micron was required to report a *specific number* for an application to comply with the policy. See RX1559; RX1568; CCRF 237. Rambus chose not to call Mr. McGhee to clarify. These references, made in a very different context years after Rambus was a JEDEC member, are hardly grounds to disregard the direct contemporaneous evidence of JEDEC's policy.<sup>36</sup>

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<sup>36</sup> Rambus represents to the Commission that the copy of the Board minutes it quotes "show approval by Chairman Rhoden . . . and by General Counsel Kelly." RB at 19 n.11. In fact, Chairman Rhoden and General Counsel Kelly approved a different version of the

**g) Alleged Failure of Others to Disclose.**

The instances Rambus cites in which JEDEC members allegedly failed to disclose relevant patents or applications to JEDEC (RB at 18) prove nothing. Contrary to Rambus's assertions, in several of the instances the appropriate patents or applications were disclosed. *See* Tr. 936-37 (Williams); Tr. 1240-42 (Rhoden). In the others, there is no evidence of what technology was being proposed, what the patent related to, whether it was a blocking or an implementation patent, whether representatives recognized a relationship between the technology being proposed and the patent, whether a disclosure was made, and if not, why not. One thing is clear: With the exception of the Seeq, Wang, and Quad-CAS incidents (CCAB 45-47), there is no evidence that any other JEDEC member has attempted, as Rambus has, to assert an undisclosed patent against companies practicing a JEDEC standard, let alone engage in deliberate concealment, misuse of JEDEC information, or other misconduct in connection with a patent ambush.

**7. Rambus Had Specific Obligations Under the JEDEC Disclosure Policy.**

Plainly, Rambus had specific obligations under the JEDEC disclosure policy that it failed to fulfill. JEDEC's disclosure policy required disclosure of issued patents and applications. Rambus's contrary argument (RB at 25-26) ignores the language of the 21-I Manual and the overwhelming weight of the evidence. *See* pages 13-30 *supra*. Rambus violated this obligation when it failed to disclose.

**a) Richard Crisp and Others Had More Than Sufficient Knowledge of Rambus Patent Interests Relevant to Ongoing**

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minutes that did not contain the language quoted by Rambus. *See* Complaint Counsel's Motion to Reopen the Record to Include Evidence that Corrects Misrepresentation in Answering Brief (July 2, 2004).

**JEDEC Work.**

*Q '91, '92, '93, '94, '95, [Richard] Crisp and the other representatives of Rambus are sitting at JEDEC meetings, they were watching standardization proposals, they are reporting back to you and everybody else at Rambus about the futures of the SDRAM standardization effort, and it is those features that Rambus was trying to cover in the claims that it was filing; don't you know that, sir?*

...

*THE WITNESS: Okay. Yes.*

*CX2088 at 143-44 (Trial Testimony of Geoffrey Tate, Rambus v. Infineon)*

*Q Would it be fair to say that at some point then in the '91 to '95 time frame you came to understand that certain members of JEDEC were expecting Rambus to identify patent rights and to identify Rambus's approach to licensing those rights?*

...

*THE WITNESS: That's my vague recollection of the issue.*

*CX2061 at 141 (Deposition Testimony of Geoffrey Tate).*

Rambus asks the Commission to find that, because JEDEC members had no obligation to search for relevant patents, only Richard Crisp's specific personal knowledge of the precise language of patent claims is relevant, and that he lacked that knowledge. RB at 25. Rambus's position is not only contrary to the evidence, but also is an invitation to game the system.<sup>37</sup>

First, Richard Crisp had the requisite knowledge. "Knowledge" does not mean that the individual in question actually read and understood the specific language of the patent claims.

Tr. 321-22 (Rhoden); Tr. 1346 (Sussman); Tr. 1698-99 (Landgraf); Tr. 1011-12 (Calvin);

CX2057 at 203-04 (Meyer). Without doubt, Mr. Crisp understood the subject matter of the

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<sup>37</sup> Rambus essentially asks the Commission to find that a person can attend JEDEC meetings and observe ongoing work, take that information to a lawyer with specific instructions of what to include in patent claims, know that the lawyer has filed amended claims with the PTO, and later observe JEDEC continue with the same work, yet have no obligation to disclose anything to JEDEC, so long as there is no proof that the individual specifically read the claims after they were filed. *But see* Tr. 1846-48 (J. Kelly).



claims in question and recognized the potential overlap between those claims and ongoing JEDEC work, which was enough to require disclosure. *See* CX1946; CX1947; CX 1949 at 1; CX0682; CX0686; CX0691; CX0797; CX0702; CX0703; CX0711 at 31, 36-37, 54, 58; CX1963; CX1973 at 79; CCF 967.

Moreover, Mr. Crisp saw many of the specific claims. He received the '651 and '692 patent applications after they were filed (CX1957; CX1961), had access to Rambus's entire patent portfolio, and in mid-1995 conducted a review of Rambus's patents. CX0798; Tr. 3584-85 (Crisp); CCF 1050-55. Having apparently shredded the cover letters identifying who received the '961 and '490 applications (*see* CCF 1744-52), Rambus cannot now assert a lack of proof that Richard Crisp was a recipient.

Second, other Rambus representatives had both the requisite knowledge and an obligation to ensure appropriate disclosure. That obligation applied to individuals with knowledge, not merely those who attended the meetings. Tr. 624 (Rhoden: the disclosure obligation "was triggered by the actual knowledge of the people that were involved, and that would be not just the representative at the meeting, but all of the people that would have been involved"); *see also* Tr. 319-20 (Rhoden); Tr. 1846-48 (J. Kelly); Tr. 2499-2500 (G. Kelley).

Rambus CEO Geoff Tate, Vice President Allen Roberts, engineer Fred Ware and in-house counsel Anthony Diepenbrock not only understood the overlap between on-going JEDEC work and Rambus's patent position, but they actively used JEDEC information supplied by Richard Crisp to further Rambus's patent position. CX1959; CX1970 at 1; CX0745 at 1. Each of these individuals had an obligation to ensure that Rambus made the appropriate disclosures to JEDEC.

**b) Rambus's Disclosure Obligation Arose Before the Final Ballot.**

Rambus's argument that any disclosure obligation arose only at the final ballot and that it had no on-going obligation after it left JEDEC in mid-1996 (RB at 24-27) invites the Commission to create a loophole ripe for exploitation by companies interested in using standard-setting as a means to ambush others.<sup>38</sup> The argument is also contrary to the record, which demonstrates that a member's disclosure obligation arose as soon as it recognized the overlap between ongoing JEDEC work and its patent rights,<sup>39</sup> and that it could not then evade its disclosure obligation by withdrawing from JEDEC.<sup>40</sup> Because Rambus failed to fulfill its obligations while it was a member, it had a duty to correct that failure after its withdrawal.

**C. Rambus Subverted the JEDEC Standard-Setting Process and Violated Specific JEDEC and EIA Disclosure Rules.**

Focusing solely on JEDEC's disclosure policy, interpreted in the narrowest possible manner (RB at 27-35), Rambus asks the Commission to disregard most of its actions, ignore Rambus's obligation to act in good faith, and evaluate its conduct based on an after-the-fact, line-by-line analysis of the patent claims actually pending while it was a member of JEDEC. Such an analysis was not expected by JEDEC at the time, and would render SSO disclosure policies largely unworkable. Nevertheless, even if the Commission were to adopt Rambus's hypertechnical approach, Rambus was obligated to disclose at least one issued patent and four pending applications.

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<sup>38</sup> Rambus essentially argues that a company can observe ongoing work at JEDEC that it recognizes as falling within its patent rights, use that information to amend its applications to ensure patent coverage of the ongoing JEDEC work, observe JEDEC finalize the details of its standards, plan to enforce its patents against its fellow JEDEC members, and yet have no disclosure obligations so long as it withdraws from JEDEC before the final ballot occurs.

<sup>39</sup> Tr. 1836-37, 1945, 1983-85 (J. Kelly); Tr. 356-57 (Rhoden); Tr. 771-72 (Williams); Tr. 1011-12 (Calvin); CX3135 at 110-11 (Chen); Tr. 1695-96 (Landgraf).

<sup>40</sup> Tr. 2758 (G. Kelley); Tr. 1992-93 (J. Kelly).

**1. This Case Involves a Pattern of Conduct Far More Extensive Than Simple Concealment of Patents and Applications.**

The Commission should resist Rambus's efforts to recast this case as involving only a limited failure to disclose. Rambus's scheme, hatched soon after joining JEDEC and deliberately pursued for a decade, involved far more.

**a) Rambus's Secret Effort to Use JEDEC Information to Amend Its Pending Patent Applications.**

*Q . . . [I]n the meetings you had with Rambus patent lawyers after a JEDEC meeting, . . . one source of the information for changing the Rambus patent claims was what you had seen at JEDEC with respect to the SDRAM standardization? Right?*

*A Yes. That's right.*

*. . .*

*Q . . . your intent was to make [the claims] broad enough that they would cover an SDRAM using the features that you had seen at the prior [JEDEC] meetings. Isn't that a fact?*

*A In some cases that was true.*

*CX2092 at 71-72 (Trial Testimony of Richard Crisp, Rambus v. Infineon)*

Rambus argues that the Commission should disregard Rambus's intentional misuse of information presented at JEDEC to broaden its patent applications, because patent law permits such amendments. RB at 89-92. But a member's use of a standard-setting organization's information to amend its own pending patent applications raises substantial risks of opportunism. CCAB at 31-40; JEDEC Brief at 33-37; SSO Brief at 10-12, 19-20; *see generally* Scholars Brief. As recognized in the Commission report issued after its 2002 hearings concerning antitrust and Intellectual property, such activity "can allow opportunistic behavior," which can "disrupt competitive activity."<sup>41</sup> Hearing panelists recognized no justification "for the use of continuation

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<sup>41</sup> FTC Report, To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy (October 2003) Chapter 4, at 28, available at

practice to broaden claims to cover competitors' subsequent products." (*id.*), and Rambus offers none. The potential competitive consequences of such activity are compounded when it is directed not at the products of a single competitor, but at an industry-wide standard, especially if the effort is "used to undercut standard setting organizations' disclosure rules." *Id.*

Such conduct necessarily implicates the Legal Guides' prohibition on using standardization to give a competitive advantage to one company or to exclude competitors from the market. CX0202 at 6. JEDEC had serious concerns about such conduct.<sup>42</sup> While a patent-holder's amendment of a pending patent application to cover an SSO's ongoing work may not always be improper, in the face of the EIA Legal Guides and the duty of good faith such conduct could be justified in JEDEC, if at all, only if a member complied scrupulously with its obligations under the disclosure policy and acted in good faith to ensure that other JEDEC members knew of the potential scope of the patents. This Rambus did not do.

**b) Rambus Affirmatively Misled JEDEC and Its Members.**

Based on carefully selected testimony from a handful of witnesses, Rambus also asks the Commission to disregard its various misleading statements. Because some JEDEC members had sufficient information to raise "flags" (RB at 43-48), Rambus asserts that members should have

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<http://www.ftc.gov/os/2003/10/innovationrpt.pdf>.

<sup>42</sup> JEDEC Brief at 34. *See also* Tr. 2002-03 (J. Kelly: it would be "an act of bad faith, to use information first learned at a [JEDEC] meeting and for your company's own advantage" to amend pending patent applications); CX2058 at 431 (Meyer: absent good faith, "everybody would run out of these meetings and use the information picked up from the meeting, use that for their own purposes . . . to seek an unfair advantage"); Tr. 1460-61 (Sussman: based on his observations, Rambus's conduct did not comply with the requirements of good faith); CX3135 at 110 (Chen: "we are not trying to take advantage of JEDEC discussion."); JX0024 at 5, 11-12; CX2608 at 2 (Kentron "firmly believes that taking information learned after the fact from any association's activities and incorporating that information into existing claims of a pending patent is not only unethical but also illegal").

figured out for themselves that Rambus was concealing something, implying that this is the equivalent of open and forthright disclosure. RB at 43-48. The inadequacy of these “flags” is described *infra* at pages 73-80; here it is enough to say that the Commission should not accept this self-serving distortion of the concept of disclosure.

Rambus does not attempt to defend important misrepresentations, including Richard Crisp’s failure to mention patent issues when he voted on and discussed the CAS latency/burst length ballot in July 1992, or his disclosure of Rambus’s irrelevant ‘703 patent in September 1993. *See* CCAB at 12-13, 14 n.9, 19-20, 50-51. For other incidents, Rambus disregards critical evidence. Rambus implies that, when Richard Crisp in 1992 responded to the Chairman’s question whether he had anything to say about possible relevant Rambus patents by shaking his head “no,” he conveyed the equivalent of truthful and accurate information. RB at 44. Rambus ignores that another JEDEC member, Howard Sussman, made a follow-up comment that “he had read [Rambus’s foreign patent application] and that there was no problem.” CX2069 at 611-13 (Crisp). Crisp understood that Sussman intended to “defuse that issue about the question about [Rambus] patents” and “to set aside the concern of the patent worry that had been raised by the people from Siemens.” *Id.* Mr. Crisp made no effort to correct the impression conveyed by Mr. Sussman, and escaped further questioning about Rambus patents.

Three years later, in September 1995, Mr. Crisp again faced uncomfortable questions about suspicions that Rambus might have patent rights related to the SyncLink presentation. When pressed, Mr. Crisp reassured members by referring to his past disclosure of the ‘703 patent, an indication that Rambus had in the past complied with the JEDEC disclosure policy. CCAB at 19-20, 50-51; CCF 1065-67.

Rambus admits that its 1996 JEDEC withdrawal letter omitted the ‘327 patent, at the time

Rambus's sole issued patent relevant to JEDEC's ongoing work, yet asserts that JEDEC was not misled because Rambus omitted the '327 patent by mistake. RB at 47-48. Even if that were true,<sup>43</sup> it makes no difference. Rambus had intentionally concealed from JEDEC the pending application that led to the '327 patent, even though JEDEC was considering the related dual-edge clock technology. CCF 1008, 1076-82, 1092-95, 1114.

**2. Rambus Failed to Disclose to JEDEC That It Could Obtain Patent Claims Covering Ongoing JEDEC Work, Its Efforts To Prepare Such Claims, or Its Belief That It Had Such Claims Pending.**

*There were various times where certain individuals believed that our patent applications should or were covering the SDRAM.*

*CX2056 at 252 (Deposition Testimony of David Mooring).*

*At the time I was – I believe[d] that the claims that were being created by [Rambus's patent lawyers] were to cover the features broadly. . . . And I assume[d] that the claims, as generated, were adequate to perform broad coverage of these features.*

*CX2103 at 99-100 (Deposition Testimony of Fred Ware).*

Rambus officers and employees, including Richard Crisp, knew that Rambus could obtain patent claims covering technologies under consideration by JEDEC and at times between 1991 and 1996 believed that Rambus had pending applications containing such claims. *See, e.g., CX0543A at 16-17; CX0606 at 2; CCF 803, 805-06, 809-811.* Rambus representatives

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<sup>43</sup> Rambus's claim that the '327 patent was omitted by mistake is highly questionable. Rambus regarded the '327 patent as highly important, and planned for its offensive enforcement. CX942; CX1267; CCF 1095, 1100-08. Rambus had known months before that the '327 would be issued. CX1482 at 1 (notice, Oct. 6, 1995). The very same day in June 1996 that Rambus sent its withdrawal letter to JEDEC (without the '327 patent), Rambus sent a written request to outside patent counsel to evaluate the '327 patent for enforcement readiness. CX0889; CCF 1100-01, 1112. In the final version of the withdrawal letter, Rambus deleted these statements that appeared in earlier drafts: "In the spirit of full disclosure, Rambus would like to bring to the attention of JEDEC all issued U.S. patents held by Rambus Inc." and "This list [of patents] is complete as of this writing and follows below." CX0873 at 1; *compare* CX0888.

concealed from JEDEC both their knowledge that they could (and intended to) obtain and enforce such patent claims, and their belief that applications containing such claims were pending at the PTO. *See, e.g.*, CCFF 813-814.

Rambus argues that, regardless of the contemporaneous knowledge and belief of its representatives, it had no obligation to disclose unless later formal analysis determined that Rambus's pending applications contained claims that actually covered ongoing JEDEC work. RB at 27-36. Rambus's position is contrary to the evidence and bad policy. The JEDEC disclosure obligation was based on the good faith knowledge and belief of members that a patent or application might apply, not on any formal patent claim analysis. CX0208 at 19 ("might be involved in"); Tr. 1980-82 (J. Kelly); Tr. 321-22 (Rhoden); Tr. 1346 (Sussman); Tr. 788-89 (Williams); Tr. 1693-94 (Landgraf); Tr. 6595 (Lee); CX2057 at 203-04 (Meyer). Rambus does not explain how, under its interpretation, a company participating in the JEDEC process would as a practical matter determine whether it was required to disclose a patent or application. *See* JEDEC Brief at 30. Rambus's position also invites gaming the system. It would encourage a devious patent-holder to delay filing claims until after quitting the organization.

Consistent with its obligations under the JEDEC disclosure policy and its obligation of good faith, Rambus should have disclosed as early as 1992 that it expected to obtain patent claims covering programmable CAS latency and programmable burst length, and as early as 1994-96 that it expected to obtain claims covering on-chip PLL/DLL and dual-edge clocking technologies, as those technologies were proposed for use at JEDEC. Even if Rambus had delayed disclosing until actually filing applications with claims covering this JEDEC work, it

should have disclosed for programmable CAS latency in May 1993 (the ‘651 application<sup>44</sup>), programmable burst length in January 1995 (the ‘961 application), and on-chip PLL/DLL and dual edge clock at the time these technologies were discussed at JEDEC between 1994 and 1996.

### **3. Rambus Had a Patent and Four Pending Applications it Was Obligated to Disclose to JEDEC.**

Even applying Rambus’s narrowest-possible interpretation of its disclosure obligations, the record establishes that Rambus failed to disclose the subject matter of a patent and four applications.

Two witnesses presented proper, formal patent claims analyses of the type used in patent infringement analysis:

- Professor Bruce Jacob, Associate Professor of Electrical and Computer Engineering at the University of Maryland, and
- Mr. Mark Nusbaum, patent attorney and former Senior Patent Examiner and member of the PTO Board of Patent Appeals and Interferences.

Following a full claims analysis, Professor Jacob and Mr. Nusbaum testified that Rambus had an issued patent and four pending applications containing claims that a reasonable engineer would conclude covered specific JEDEC work:

‘961 application: claims 151, 160, and 165 covered programmable CAS latency and burst length, and claims 159, 164 and 168 covered programmable CAS latency, as used in the SDRAM standard. Tr. 1550-55, 1565-72 (Nusbaum); 5508-13, 5523-28 (Jacob); DX 15, 99, 100.

‘490 application: claims 183, 184 and 185 covered programmable CAS latency as used in the SDRAM standard. Tr. 1573-77, 1581 (Nusbaum), 5528-32 (Jacob); DX 15, 99, 100.

‘692 application: claims 151, 152, 166 and 167 covered on-chip PLL as proposed by NEC for use in the JEDEC standard in September 1994. Tr. 1589-95 (Nusbaum), 5535-

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<sup>44</sup> Although Rambus later discovered that the claims were narrower than intended, at the time, Rambus representatives understood the ‘651 application to cover programmable CAS latency as proposed for use at JEDEC. CX0702; CX2103 at 99-100 (Ware).



41 (Jacob), DX 15, 16, 99, 101.

'646 application: claim 151 covered dual edged clocking as proposed by IBM in April 1992, as reflected in the survey ballot of October/December 1995, and as proposed by Samsung in March 1996. Tr. 1601-03 (Nusbaum), 5550-51 (Jacob); DX 15, 16, 99.

'327 patent: claims 1 and 7 covered the most likely implementation of dual edge clocking as proposed by IBM in April 1992, as reflected in the survey ballot of October/December 1995, and as proposed by Samsung in March 1996. Tr. 5543-49 (Jacob); DX 99.

Rambus's countervailing reliance on the Federal Circuit pronouncement in the *Infineon* case that the '961 application did not read on the SDRAM standard (RB at 30-31) is misplaced. The *Infineon* record contained no evidence on this issue,<sup>45</sup> and the evidence here confirms that the Federal Circuit erred. The Federal Circuit majority opined that the claims in the '961 application were limited to the "device identifier" feature. *Rambus, Inc. v. Infineon Tech. AG*, 318 F.3d 1081, 1103 (Fed. Cir.).<sup>46</sup> In fact, Professor Jacob confirmed that, while some claims of the '961 application were so limited, the relevant claims 151, 160, 164, and 165 were not. Tr. 5676-80 (Jacob). Rambus has no similar limiting language argument with respect to the '327

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<sup>45</sup> As stated by Judge Prost:

The majority has gone so far as to make a de novo comparison of the pending claims to the JEDEC standard . . . I do not believe that we, as an appellate court of review, are in a position to make this finding because neither party appears to have given the jury the necessary evidence to make such an analysis in the first instance.

318 F.3d at 1117 (Prost, J., dissenting).

<sup>46</sup> Rambus's reliance on the Federal Circuit's holding is misplaced for more global reasons than this. As explained by Judge Payne, "[n]othing in the Federal Circuit's opinion negates the overwhelming evidence that Rambus planned a fraudulent scheme to obtain claims covering the SDRAM standard and to conceal these claim[s] from JEDEC." *Rambus, Inc. v. Infineon Tech. AG*, 220 F.R.D. 264, 279 (March 17, 2004).

patent or any of the other applications.<sup>47</sup>

Rambus argues that the '961 and '490 applications were later rejected (RB at 31), implicitly conceding that they were valid pending applications when Rambus belonged to JEDEC. More importantly, nothing about the rejection precluded Rambus from later refiling and obtaining identical or substantially similar claims. Rambus in fact did so and later asserted patent claims against firms practicing the JEDEC standard based on patents tracing their lineage to these applications. *See* CCF 858.

Finally, Rambus argues that none of the vast number of documents that it destroyed could have affected this analysis. RB at 35. But internal Rambus correspondence, correspondence between Rambus and its patent counsel, counsel's handwritten notes and claim analysis all could have shed light on the scope of Rambus's claims and their relation to JEDEC work, and all were among the massive volume of materials destroyed. Any doubt whether Rambus's pending claims covered ongoing JEDEC work – if relevant to liability – should be resolved in Complaint Counsel's favor.

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<sup>47</sup> Rambus's argument with respect to the '490 application is contradictory: Rambus insists that the Commission must base an obligation to disclose on a complete, technical and detailed claims analysis, but argues that the Commission should disregard this very analysis because the '490 application is "similar to" the '961 application. RB at 31.

**4. Rambus’s Obligations Applied Equally to the DDR SDRAM Standard.**

Rambus argues that it had no obligation to disclose with respect to some of the JEDEC standard technologies because it withdrew from JEDEC before standardization of DDR SDRAM began. RB at 32-34. Its position invites gaming the system,<sup>48</sup> imputes a meaningless formalism to JEDEC procedures, and ignores actual work at JEDEC during the period Rambus was a member.

**a) The Formal Date the Complete DDR SDRAM Package Was Proposed Has No Relevance to Rambus’s Disclosure Obligations.**

Rambus relies on the *Infineon* decision to assert that it had no disclosure obligation with respect to the DDR SDRAM standard. RB at 34. But whatever evidence or assumptions underlay that decision, it is flatly contrary to the evidence in this record.

The JEDEC disclosure policy required members to disclose patents and applications relating to “the work they are undertaking.” CX0208 at 19. There is no reference to the concept of a formal “start-date” of a standard, or indeed the concept of one particular standard versus another, and for very good reason: JEDEC work is on-going and cumulative. The SDRAM standard was based on the former EDO standard, and was published as an integral part of JEDEC’s compendium of standards. CCF 500-12; JX0056 at 103-24. Technologies added to the SDRAM standard, including programmable CAS latency and burst length, were carried over

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<sup>48</sup> Rambus asks the Commission to interpret JEDEC’s disclosure policy to permit a company to join JEDEC, observe features proposed for use in the next generation standard, use that information to amend its pending applications, plan to enforce its patents against those features, conceal its potential patent rights from JEDEC, wait for adoption and lock-in, and then enforce its patents. According to Rambus, this is legitimate so long as the company withdraws from JEDEC before the final package of features for the standard is formally proposed at JEDEC.

into the next generation, or DDR, standard.<sup>49</sup> JX0057 at 13. Other technologies, such as dual-edge clocking, were considered and rejected for the SDRAM standard, but were consciously put on hold for reconsideration in the next-generation standard. CCFF 623-32; Tr. 2515, 2584-85 (G. Kelley); Tr. 462 (Rhoden).

Thus, DDR SDRAM consists of technologies carried through from EDO and earlier standards, technologies added in SDRAM, technologies considered for SDRAM but set aside, and technologies first proposed after adoption of the SDRAM standard. This is reflected in its publication in Release 9 of the 21-C standard, which combined elements of SDRAM and DDR SDRAM. *See, e.g.*, CX0234 at 150 (3.11.5.1.3) (standard for programmable CAS latency and burst length for single data rate SDRAM and DDR SDRAM). Features of DDR SDRAM (including programmable CAS latency and burst length, on-chip DLL and dual-edge clocking) in turn were carried over into the DDR2 SDRAM standard. One cannot separate the work involved in one standard from the work involved in another, let alone define a meaningful precise start-date for any of these standards.<sup>50</sup>

The record confirms that JEDEC's disclosure policy was tied to ongoing work, not to any particular formality such as a start-date. *See, e.g.*, Tr. 1983-85 (J. Kelly: disclosure obligation is "not tied to a formal step in the process," and is "not tied to any procedural formality in the process at all."); Tr. 2586-87 (G. Kelley: disclosure obligation relating to dual-edge clocking

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<sup>49</sup> *See* CCFF 586-93. Other technologies carried over from SDRAM to DDR SDRAM included auto-precharge (which Rambus sought to patent because of its "high harassment value," CX0738), multi-bank design (the subject of Mr. Crisp's 1992 shake-of-the-head incident, after which he worked with Mr. Vincent to patent it) and externally-supplied reference voltage (that, according to Mr. Crisp, "may well infringe our work," CX0711 at 54).

<sup>50</sup> Thus, Gordon Kelley defines the start of DDR SDRAM as 1988, when IBM first proposed its toggle mode, a form of dual-edge clocking. Tr. 2584-85.

was not limited to post-December 1996). Rather, the duty to disclose arises “[i]f there is any suggestion that the committee’s work should move in a certain direction or any information that’s presented with that as . . . the intent.” Tr. 1883-83; *see also* Tr. 356-57 (Rhoden: disclosure required “as soon as you become aware that a topic is being discussed for which you know that there is IP”); Tr. 771-72 (Williams: disclosure needed “[a]s soon as you knew that there was a possible patent that could apply to what was being discussed”). Uncontested witness testimony confirms that the disclosure obligation was triggered by JEDEC work on particular DDR SDRAM technologies. Tr. 468, 493, 514 (Rhoden, on-chip PLL/DLL); Tr. 2571 (G. Kelley: same); Tr. 1406-07 (Sussman: same); Tr. 2570-71 (G. Kelley: dual-edge clocking); Tr. 1381-82, 1386, 1408-09 (Sussman: same); Tr. 512-14 (Rhoden: same).

Nor can Rambus contest that when it observed these technologies at JEDEC, it believed it had pending applications covering these technologies directed at future SDRAMs, it further amended its pending applications, or that it was planning to enforce patents against them.<sup>51</sup>

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<sup>51</sup> CX0702 (DLL application “directed against future SDRAMs”); CX0711 at 36-37 (“NEC PROPOSES PLL ON SDRAM!!! . . . What is the exact status of the patent with the PLL claim?\*\*\*\*\*”); CX0757 (“we better stock up our legal warchest”); CX0763 (“I would hope that we would sue other companies” for using on-chip PLL); CX0831 (send materials on competition, such as “JEDEC meeting reports,” to help “strengthen [Rambus’s] IP position”); CX0833 (“Let the IP war begin”); CX1483 (further DLL amendment); CX0260 at 1; Tr. 3328-29 (circulating JEDEC survey ballot, which included on-chip PLL/DLL, within Rambus); CX1999 (meeting with patent counsel concerning on-chip DLLs); CX0868 (Crisp e-mail emphasizing Micron’s JEDEC proposal regarding on-chip DLL and alternatives; “we should have a long hard look at our IP and if there is a problem . . . we should tell JEDEC”); CX2001 (meeting with Lester Vincent concerning on-chip DLLs); CX0745 (dual-edge clocking application “for the MOST/SDRAM defense”); CX0711 at 156-57 (e-mail regarding SyncLink’s JEDEC proposal using dual-edge clocking for input); CX1482 (notice of allowance for ‘646 application); CX1267 (Rambus’s “Offensive” patent strategy regarding DLLs and dual-edge clocking); CX0260 at 1 (circulating JEDEC survey ballot, which included dual-edge clocking, within Rambus); CX1320 at 4-5, CX0905 (Crisp presentation, two months after leaving JEDEC but based on earlier confidential JEDEC information, showing SDRAMs with dual-edge clocking); CX1494 (issuance of ‘327 patent); CX0889 (seeking enforcement readiness opinion on the ‘327 patent).

**b) JEDEC Worked on the DDR SDRAM Standard While Rambus Was a Member.**

The record establishes that JEDEC began work on what became DDR SDRAM no later than late 1993/early 1994, two-and-a-half years before Rambus quit JEDEC.

At that time, JEDEC began work on the next generation standard to follow SDRAM. CCF 578-85; Tr. 460-61 (Rhoden: in 1993-96, JEDEC was working on “future generation DRAM,” sometimes called “SDRAM II,” which led to DDR SDRAM); Tr. 2566-67 (G. Kelley: after adoption of SDRAM, JEDEC pursued “the next generation of synchronous DRAM”); Tr. 1402 (Sussman); Tr. 820 (Williams: after publication of SDRAM, JEDEC took up “the next standard, the next generation of memory”). Work on “future SDRAM,” “next-generation SDRAM,” or “SDRAM II,” as it was known, led directly to DDR SDRAM. Tr. 408-09 (Rhoden); Tr. 2581 (G. Kelley); Tr. 6636 (Lee); Tr. 1429 (Sussman).

JEDEC’s work throughout 1994-96 consisted of discussion, debate, and movement towards consensus on specific individual technologies for the standard. In December 1996, after some consensus was emerging with respect to individual features, Fujitsu for the first time made a package proposal that was “a collection of the discussions that had taken place . . . within previous meetings for the past decade or so” and was “a unified approach to the next generation” standard. Tr. 1197-98 (Rhoden). The presentation for the first time “happened to coin the name DDR” (*id.*), which stood for “double data rate.”<sup>52</sup>

Rambus’s argument that it had no obligations whatsoever until the formal start-date of the DDR SDRAM standard is contradicted by the record. Even crediting this argument, however, the evidence shows that JEDEC started on the DDR SDRAM standard, under different

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<sup>52</sup> Rambus mischaracterizes this testimony by referring only to the portion regarding the DDR name and omitting the rest. RB at 33.

names, no later than late 1993/early 1994.

**D. Rambus's Subversion of JEDEC's Process and Violations of JEDEC's Specific Disclosure Rules Had No Procompetitive Justification.**

Despite pointing fingers at others for their alleged inadequacies or wrong-doing, Rambus has failed to identify any compelling procompetitive justifications for its own conduct. Although concerns about preserving foreign patent rights and trade secrets might justify concealing certain patent-related information outside the context of a standard-setting organization, such concerns provide no justification for seeking to exploit participation in a cooperative standard-setting effort to obtain a patent advantage over a supposedly open standard.

Rambus's asserted justifications for its conduct<sup>53</sup> are facially insufficient, and fail to explain how the goals of lower prices, improved quality or increased efficiency were served. If accepted, they would permit any company to flout the rules of any standard-setting organization it chose to join, and defend its conduct after-the-fact by claiming protection of trade secrets or foreign patent rights. The only concrete reason for Rambus's conduct was to mislead JEDEC and increase its leverage over the industry.

Rambus's reference to preserving trade secrets is a pretext. Not only was the RDRAM architecture known, but the description of RDRAM in Rambus's PCT application was publicly available (CCFF 1267) and Rambus actively promoted RDRAM as widely as possible among DRAM manufacturers and users (CCFF 746-56, 1342-50). The "secret" was not Rambus's invention, but rather its plan to obtain claims covering not only RDRAMs but also JEDEC standard products.

Nor did Rambus's secrets have anything to do with concealing the direction of its R&D.

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<sup>53</sup> These amount to little more than generic platitudes. RB at 49-50, 86-88, 114-15.

Rambus was not concealing newly-filed applications relating to on-going research, but amendments relating back to its original '898 application filed years earlier. CCFF 725-31. These amendments added claims covering other companies' work presented at JEDEC and observed by Rambus. Rambus can hardly claim an interest in maintaining "trade secrets" relating to work performed and presented publicly by other companies.<sup>54</sup>

The legitimacy of Rambus's conduct is impeached by Rambus's constantly shifting stories. Initially, rather than explain its conduct, Rambus denied it ever happened. Believing that communications with outside counsel would remain secret, Rambus claimed that it was trying to obtain patents covering only RDRAM, and denied that it was pursuing patents directed at JEDEC-compliant SDRAMs. Rambus went so far as to submit a formal white paper to FTC staff asserting repeatedly that Rambus never sought patents covering the SDRAM standard while it was a JEDEC member:

Rambus . . . was not seeking any patents that covered the SDRAM standard during the time that the standard was being considered by JEDEC.

CX1883 at 11; *see also id.* at 12 ("Rambus never even sought [a patent covering the SDRAM standard] while it was a member of JEDEC.").

Rambus' early patent applications were directed to protecting the Rambus architecture that Rambus was seeking to have the industry adopt.

CX1883 at 15.

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<sup>54</sup> Rambus also refers vaguely to protecting foreign patent rights. RB at 87-88. However, Rambus's PCT application, filed in 1991 (CCFF 1117), gave Rambus priority over any other filer in over 40 member countries. U.S. Patent & Trademark Office, Manual of Patent Examining Procedure, Chapter 1800 (Rev. 2, 2004), available at [http://www.uspto.gov/web/offices/pac/mpep/mpep\\_e8r2\\_1800\\_508.pdf](http://www.uspto.gov/web/offices/pac/mpep/mpep_e8r2_1800_508.pdf). Moreover, publication of the PCT application acted as prior art that could invalidate later-filed applications worldwide. CX1454.



Then, in March 2001, Judge Payne pierced the attorney-client privilege under the crime-fraud doctrine. The resulting materials belied Rambus's statements in its White Paper to the FTC staff – while it was a JEDEC member Rambus had, in fact, pursued amendments to its pending applications specifically directed at SDRAMs and future SDRAMs.<sup>55</sup> After this came to light, Rambus witnesses suddenly changed their tune. For the first time, they admitted that the applications pursued by Rambus during this time-period were not limited to RDRAMs, but were directed at SDRAMs as well:

**Before Release of Crime-Fraud Materials:**

Mooring: “Q Okay. Now in ‘91, in ‘90, ‘91, ‘92, ‘93, ‘94, ‘95 and ‘96, Rambus had pending applications that related to the work of JEDEC, true or false?”

...

THE WITNESS: No. The pending applications related to the RDRAM.”  
CX2054 at 165-166 (11/15/00)

**After Release of Crime-Fraud Materials:**

Tate: “I believed . . . that we were trying to get claims that covered our inventions and would read on synchronous SDRAMs.”  
CX2092 at 139 (4/25/01)

Crisp: “My role [in discussions with outside patent counsel] was suggesting that we wanted to ensure that we had adequate coverage to protect our inventions.

Crisp: “Q . . . your intent was to make [the new claims] broad enough that they would cover an SDRAM using the features that you had seen at the prior [JEDEC] meetings.

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<sup>55</sup> CX1941 at 1 (Vincent notes: “Jedec” and “need pre planning before accuse others of infringement”); CX1946 (Vincent notes: “Richard Crisp wants to add claims to the original application”); CX1949 at 1 (Vincent notes: “what to include in divisional applications . . . so cause problems w[ith] synch DRAM”); CX0702 (Ware e-mail: “This claim . . . is directed against SDRAMs.”); CX1970 at 1 (Vincent notes: “Enforcement: Sync DRAMS”); CX0738 (Dillon e-mail proposing claims to “gain leverage over SDRAM and MOST.”); CX0740 (Tate e-mail requesting list of claims “that read directly on current/planned sdrams”); CX0745 at 1 (Roberts note: “claims for the MOST/SDRAM defense.”); CX0831 (Tate e-mail requesting staff to send “JEDEC meeting reports, etc” to help “strengthen our IP position relative to competition”).

Q. And by ‘our inventions’ what did you mean?

A. I meant the inventions of Rambus, the RDRAMs.”  
CX2053 at 397 (11/9/00)

Isn’t that a fact?

A In some cases that was true.”  
CX2092 at 72 (5/2/01)

Crisp: “in every case I was always looking at this from the perspective of our [RDRAM] devices with the narrow bus and the packet oriented configuration.”  
CX2053 at 456 (11/9/00)

Crisp: “Q Am I right, sir, that Rambus was intentionally drafting claims to intentionally cover JEDEC SDRAMs?

A Partially true, yes.”  
CX2092 at 191-192 (5/2/01)

Crisp: “I wasn’t thinking in terms of SDRAM.”  
CX2053 at 404 (11/9/00)

Crisp: “Q So it is your testimony that you were telling the board of directors in October of 1992 that the Rambus patent strategy was to broaden the claims to cover SDRAMs, you just didn’t mention the word JEDEC? Is that – do I understand your testimony correct?

A I think that was part of what I discussed.”  
CX2092 at 162 (5/2/01)

Judge Payne found that Rambus’s explanation for the shifting stories – that Messrs. Crisp and Tate “suffered from a memory lapse” – “simply strains credulity,” and that these witnesses “simply did not admit the truth.” *Rambus, Inc. v. Infineon Tech.*, 155 F.Supp 2d 660, 682-83 (E.D.Va.. 2001), *reversed on other grounds*, 318 F.3d 1081 (Fed. Cir. 2003). He found that Rambus committed “litigation misconduct” based on such “false or misleading testimony” by Rambus representatives, as well as Rambus’s destruction of documents and other discovery misconduct. *Id.* at 680-81.<sup>56</sup>

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<sup>56</sup> Based in part on Rambus’s “litigation misconduct,” Judge Payne awarded Infineon attorneys fees in excess of \$7 million. *Infineon*, 155 F.Supp 2d at 682, 691. The Federal Circuit did not disturb this holding of litigation misconduct, although it remanded for reconsideration the fee award. *Infineon*, 318 F.3d at 1106.

This document destruction campaign also belies the assertion of a legitimate business justification. Rambus attempts to portray its two-year campaign, which involved shredding over 20,000 pounds of documents in a single day, as entirely innocent. But two recent opinions by Judge Payne found otherwise. Based on an *in camera* review of over 4,600 allegedly privileged documents, Judge Payne concluded that Rambus’s destruction of documents “was accomplished as part of the same ongoing litigation strategy of which its document retention program was an integral part” and “included many of the kinds of documents usually generated in the course of business that contain information that is useful in ascertaining truth and in testing the validity of positions taken in litigation . . . as well as information about activities at JEDEC.” Memorandum Opinion (Payne, J.), *Rambus, Inc. v. Infineon Tech. AG*, Civil Action No. 3:00cv524 (May 18, 2004) at 43, 46 (Attachment A). In other words, documents that would have shown Rambus’s true motives in pursuing its conduct with respect to JEDEC were precisely the documents that Rambus destroyed.<sup>57</sup>

Rambus’s current proffered after-the-fact justifications are inconsistent with reality, as were its earlier shifting stories. The contemporaneous evidence shows that sound business considerations should have led Rambus away from its actual conduct, to avoid the risk that its

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<sup>57</sup> In a separate opinion issued the same day, Judge Payne stated:

Those documents [withheld by Rambus] contradict the assertions made by Rambus in the FTC proceeding and here that its document retention program was conceived, adopted, and implemented for benign and legitimate purposes. Instead, the documents quite strongly indicate that . . . the document retention policy was part and parcel of the company’s litigation strategy.

Memorandum Opinion (Payne, J.), *Rambus, Inc. v. Infineon Tech. AG*, at 18 (E.D. Va., May 18, 2004) (Attachment B). Based on its review of these documents, Judge Payne determined that Rambus extracted and used selected pages from a document never produced in full to the FTC in an effort to persuade the ALJ of an argument contradicted by documents it withheld. *Id.* at 8.

patents might become unenforceable. CCAB at 55-56; Tr. 7170-71, 7500-05 (McAfee); CX3125 at 320-21 (Vincent); CCF 850-51. Rambus deliberately chose to conceal relevant applications, not out of concern over interference proceedings or loss of foreign patent rights, but to avoid JEDEC members considering alternative technologies before they were locked in to the Rambus technologies. *See* CX0711 68 at 73 (“it makes no sense to alert them to a potential problem they can easily work around.”); CX0919 (“do **\*NOT\*** tell customers/partners that we feel DDR may infringe – our leverage is better to wait”). Rambus sought to obscure the true motivation for its conduct by destroying relevant documents and lying – until it got caught. The Commission should disregard Rambus’s self-serving, after-the-fact justification.

**II. Rambus’s Exclusionary Conduct Contributed to Rambus’s Unlawful Acquisition of Durable Monopoly Power.**

**A. Rambus’s Acquisition of Monopoly Power Arose from its Exclusionary and Deceptive Course of Conduct.**

Rambus does not contest that it holds monopoly power. It asserts, however, that Complaint Counsel has failed to prove that Rambus’s decade-long course of conduct was the but-for cause of its acquisition of that power. Rambus’s argument is wrong on the law, wrong on policy, and wrong on the facts.

**1. The Appropriate Focus Is Whether Information Withheld by Rambus Was Material.**

The requisite “causal link” between a monopolist’s conduct and anticompetitive harm is satisfied if the monopolist’s conduct “reasonably appear[s] capable of making a significant contribution to creating or maintaining monopoly power.” 3 Philip Areeda & Herbert Hovenkamp, *Antitrust Law* (“Areeda & Hovenkamp”) ¶ 651f, at 83-84 (2002); CCAB at 74. The *Microsoft* court, quoting this formulation with approval, specifically rejected the proposition that § 2 liability (as opposed to damages) should turn on “a plaintiff’s ability or inability to reconstruct the hypothetical marketplace absent a defendant’s anti-competitive conduct.” *Microsoft*, 253 F.3d at 79.

Rambus’s discussion of *Microsoft* tracks the correct framework for causation analysis. Rambus explains that, in *Microsoft*, the government proved the first link in the causation chain – that Microsoft engaged in a “pattern of . . . exclusionary conduct that had the purpose and effect” of denying Netscape’s access to the most effective means of distribution. RB at 121. According to Rambus, the *Microsoft* court then found that “Netscape might have flourished” and, if it had, its product “might have served as a middleware platform” to erode Microsoft’s monopoly. RB at 122 (emphasis added). Complaint Counsel has proven far more. We proved that Rambus successfully engaged in a decade-long “pattern of . . . exclusionary conduct that had the purpose and effect,” *id.*, of securing patent coverage over JEDEC’s standards and denying JEDEC and its members information about that conduct. We further proved that, had Rambus disclosed, JEDEC and its members not only might, *id.*, but likely would, have adopted alternative technologies, or at a minimum negotiated in advance, so as to prevent Rambus’s exercise of monopoly power. *See* CCAB 77-103; pages 72-84 *infra*. *Microsoft* establishes that, having

shown Rambus’s exclusionary conduct caused JEDEC’s lack of material knowledge, a finding that JEDEC and its members “might” have acted differently suffices to establish antitrust liability in a government action for injunctive relief.<sup>58</sup>

Rambus also quotes highly probative language from Areeda & Hovenkamp: “[B]efore [an inference] can properly be used against the defendant, it must at least appear plausible’ that the challenged conduct ‘could have had, or would probably have, a *significant relationship* to the defendant’s monopoly.’” RB at 123 (quoting Areeda & Hovenkamp, ¶ 651c at 78 (1996) (emphasis added by Rambus)). Rambus omits the conclusion in the very next sentence – that exclusionary behavior is conduct other than competition on the merits “that reasonably appear[s] capable of making a significant contribution to creating or maintaining monopoly power,” Areeda & Hovenkamp ¶ 651 at 83-84, and instead tacks on its own wholly unsupported and contradictory language to the end of the passage. RB at 123. Areeda & Hovenkamp explain why, particularly in a government enforcement action seeking injunctive relief, the appropriate standard of causation is whether the conduct “reasonably appear[s] capable of making a significant contribution to creating or maintaining monopoly power.” Areeda & Hovenkamp, ¶¶ 650a at 67-68, 651d at 79-81, 651f at 83-84.

Rambus conflates the causation standard in a government action for injunctive relief with the requirement that a private plaintiff has to prove antitrust injury. RB at 116-120. But Rambus

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<sup>58</sup> Rambus also attempts to distinguish *Microsoft* on the grounds that, in *Microsoft*, the subsequent potential events that might have occurred had no historical precedents. RB at 123. Again, this case is no different. There is no precedent for knowing precisely how JEDEC members would have evaluated each of the technologies in question compared with the various available alternatives with full knowledge of Rambus’s patent position. Indeed, the rule flouted by Rambus was designed to avoid just such second-guessing. The available evidence strongly indicates, however, that JEDEC would have selected alternate technologies or, at a minimum, members would have negotiated beforehand with Rambus. CCAB at 77-103.

cannot avoid the court’s conclusion in *Microsoft* that there was no precedent “standing for the proposition that, as to § 2 liability in an equitable enforcement action, plaintiffs must present direct proof that a defendant’s continued monopoly power is precisely attributable to its anticompetitive conduct.” *Microsoft*, 253 F.3d at 79. See *Areeda & Hovenkamp* ¶¶ 653b at 98-100, 653i at 105-06, 656c at 110-11, 657a at 112-14.

Rambus tries to evade this authority by wrongly equating the proposed relief to partial divestiture. RB at 124. The proposed relief, however, is a tailored injunction preventing Rambus from continuing to enforce its improperly acquired power over JEDEC-compliant products. This remedy would not forfeit *any* intellectual property rights unrelated to Rambus’s conduct at JEDEC. See pages 96-97, 105 *infra*. In any event, the heightened causation requirement urged by Rambus does not relate to whether the conduct is illegal; as the *Microsoft* Court stated, “these issues go to questions of remedy, not liability.” *Microsoft*, 253 F.3d at 80.

Rambus continues to try to graft onto the standard for antitrust liability a requirement that Complaint Counsel prove that JEDEC’s 60+ members actually relied on Rambus’ deceptive conduct. RB at 116.<sup>59</sup> Rambus is wrong on the law: Complaint Counsel need not show reliance. Rambus is wrong on the policy: JEDEC’s disclosure rule serves the purpose of a reliance test. Rambus is also incorrect on the facts: JEDEC and its members in fact relied on Rambus’s omissions and misstatements.

To support its position, Rambus relies on cases involving false advertising and fraud on the patent office, where the reliance requirement has been imported from analogous tort cases. Courts require a showing of actual reliance because buyers recognize disparagement as “non-

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<sup>59</sup> Rambus does not even try to defend the ALJ’s erroneous adoption of a “reasonable reliance” standard. ID at 304-05; CCAB at 76 n.75.

objective and highly biased” so that “buyer distrust of a seller's disparaging comments about a rival seller should caution us against attaching much weight to isolated examples of disparagement.” *American Profl Testing Service, Inc. v. Harcourt Brace Jovanovich Legal and Profl Publications, Inc.*, 108 F.3d 1147, 1152 (9th Cir. 1997). The causation requirement is heightened for fraud on the patent office because such antitrust claims “serve[] as a sword” by subjecting patent holders to treble damages. *Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059, 1070 (Fed. Cir. 1998). In contrast, a patent holder may be stripped of its patent rights and subject to attorneys’ fees if it has engaged in inequitable conduct before the patent office, which may be based on “a lesser misrepresentation or an omission, such as omission of a reference that would merely have been considered important to the patentability of a claim by a reasonable examiner.” *Id.* Here, the remedy sought is not damages or disgorgement, but rather enjoining future patent enforcement against JEDEC-compliant products.

Rambus’s argument does not fit the standard-setting context. JEDEC’s insistence on disclosure demonstrates the materiality of patent-related information. Its rules and procedures create the presumption that members relied on disclosures – and omissions. Under such circumstances, there is no efficiency-enhancing reason to condition challenge of a monopolist’s acquisition of monopoly power through intentional misconduct on complex after-the-fact proof that 60+ JEDEC members actually relied on such conduct.

But even if the Commission were to require proof of reliance, Rambus is wrong on the facts – JEDEC members did rely on Rambus’s conduct. *See* pages 72-84 *infra*.



**2. Rambus's Course of Conduct Was More Than Capable of Contributing To Its Monopoly Power, and the Record Establishes that It Did Just That.**

Rambus does not even attempt to refute the fundamental premise underlying its decade-long course of conduct. The scope of its potential patent rights was material to JEDEC and its members, and Rambus representatives believed concealing that information would contribute to its monopoly power. CCAB 77-89. Rambus does not contest that:

- Rambus failed to disclose its patent or applications relating to on-going JEDEC work or its efforts to extend its patent rights;
- multiple alternatives to each of the technologies at issue existed at the time of JEDEC's work;
- even absent disclosure by Rambus, leading companies in the industry vigorously promoted alternatives at JEDEC;
- the one time JEDEC recognized that a proposal might encroach on Rambus's patents, JEDEC immediately dropped the proposal; and
- multiple witnesses testified that they and/or their companies would have made different choices had they been informed of Rambus's patent rights.

Instead, Rambus argues that both its deception and JEDEC's rules were irrelevant because JEDEC would have adopted Rambus's technologies no matter what Rambus disclosed or charged. The main basis for this is Rambus's paid experts' claims that: Rambus would have abandoned its business strategy and agreed to a RAND commitment; the alternatives were inferior; there might have been other patents relating to 3 out of 23 proposed alternatives; post-lock-in events in 2000 allegedly show that JEDEC used the same technologies; and the royalty rates are reasonable and consistent with RAND. Rambus's assumptions, inferences and arguments are contradicted by the overwhelming weight of the evidence.

a) **Had Rambus Disclosed, JEDEC Could Not Have Adopted the Technologies Because Rambus Refused RAND Terms.**

*Q . . . Did Rambus ever . . . at any time, give JEDEC a RAND assurance letter?*

*. . .*

*THE WITNESS: Well, the short answer is no.*

*CX2112 at 213 (Deposition of David Mooring)*

*[S]tandards bodies often said they wanted licenses under a reasonable, nondiscriminatory basis. And my best recollection is that Rambus licenses, that was not the basis for them. . . . That [Rambus] did not necessarily have to license everybody, they could license who they wanted to.*

*CX3129 at 488-89 (Deposition of Lester Vincent)*

Rambus’s hypothetical argument that, had it disclosed, JEDEC nevertheless would have adopted the same technologies (RB at 67) founders on a fundamental point: Even had JEDEC members wanted to adopt those technologies, JEDEC rules *prohibited* them from doing so absent a RAND commitment from Rambus.<sup>60</sup> And Rambus refused to commit to RAND. CCAB at 100-01; CX2112 at 213.

Relying entirely on Dr. Teece, Rambus argues that, but for Rambus’s “real world confusion” about what RAND entailed, Rambus would have agreed to RAND terms (which would be “consistent with Rambus’s real-world conduct”). RB at 69-70. Dr. Teece based his opinion entirely on theory, however, with no record support. Tr. 10709-12 (Teece). Had he considered the factual evidence, Dr. Teece would have understood that Rambus’s refusal to

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<sup>60</sup> JX0053 at 11; JX0054 at 9 (“No program standardization shall refer to a patented item or process unless . . . the committee chairman has received a written expression from the patent holder” to license without charge or on RAND terms); CX0208 at 19; Tr. 1874, 1884-87 (J. Kelly: “it is a firm, absolute requirement. . . . [I]f the patent owner does not give the assurances, the committee is basically – cannot move forward to standardize along the lines of the patented technology.”); Tr. 349-50 (Rhoden: there is “no case” where a patented technology would be included in a standard absent a RAND commitment. “That would not happen.”).

agree to RAND was no mistake, but part of Rambus's carefully-calculated business strategy. Rambus refused RAND specifically because it wanted to refuse to license some companies, and to license companies at different rates, in order to manipulate supply and demand. CX2083 at 98 (Davidow: Rambus believed it "could license the technology selectively"); CX2109 at 106 (Davidow advocated licensing only one U.S., one Japanese and one European company and maybe Samsung); *id.* at 229 (Davidow thought Rambus should "license DDR restrictively to increase value and leverage"); CX3129 at 488-89 (Vincent). Rambus deliberately refused RAND terms when it withdrew from JEDEC.<sup>61</sup>

Rambus also speculates that maybe JEDEC would have disregarded its rule. RB at 67-69. Rambus cites to a single instance – the Echelon case – where JEDEC knew that Echelon was attempting to delay passage of a standard by falsely claiming to have relevant patents. Tr. 2135 (J. Kelly). On its face this situation in no way suggests that JEDEC would have waived RAND assurances for valid Rambus patent claims, had they been disclosed. Rambus also cites to the notation "patent alert" in the March 1993 minutes, RPF 1228-32, with no indication as to what the alert was, what company's patents were involved, whether there was any basis to conclude that any patents might cover the standard, or, if so, whether the patent-holder provided a RAND commitment. The record is clear, however, that, whatever discussion occurred, JEDEC members believed that the resulting SDRAM standard was free of known patents. CX2089 at 151-52 (Meyer); Tr. 528-29 (Rhoden); Tr. 1454-55 (Sussman); Tr. 2592-93 (G. Kelley); Tr. 5813-14, 5880-81 (Bechtolsheim).

These two simple facts – JEDEC prohibited adopting patented technologies without a

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<sup>61</sup> Rambus also argues that it believed that JEDEC's policy was onerous until it made inquiries. RB at 70. But it fails to mention that it refused to accept RAND terms *after* RAND was explained by JEDEC members. CX0873; CX0874; CX0853 at 2.

RAND commitment, and Rambus's strategy was not to provide a RAND commitment – defeat all of Rambus's speculation about the but-for world. Had Rambus disclosed on a timely basis, JEDEC would have adopted different technologies.

**b) Rambus's Argument That All Alternatives Were More Costly and Technically Inferior Is Contradicted by the Overwhelming Weight of Reliable Evidence.**

*I think that technologists always look and say, oh, well, this is . . . a techn[ically] superior solution and everybody's going to want it. And customers . . . say, oh, well, I've got all kinds of trade-offs I can make and, you know, I don't need the world's fastest widget if I can, you know, save a little money or have a little bit more security or have an extra source of supply or something like this. So it's – I think that it's very important to appreciate all the trade-offs that can be made.*

*CX2109 at 113-14 (Deposition of William Davidow)*

*I'm always amazed at how many technological alternatives there are to getting things done and still ending up with a satisfactory competitive solution.*

*CX2109 at 116-17 (William Davidow)*

Rambus also asks the Commission to find that, had Rambus disclosed, JEDEC would have adopted the same technologies and accepted Rambus's royalty demands because available alternatives were technically inferior and more expensive. RB at 61-67.

This argument ignores the most important evidence concerning the viability of alternatives – the competition among these alternatives that actually occurred within JEDEC. CCAB at 82-88. The argument also ignores evidence from leading industry sources. In addition to Professor Jacob, who testified at length as an expert on this subject (Tr. 5363-458), an extraordinary range of witnesses representing leading companies from all sectors of the industry identified specific viable alternative technologies:

**Andreas Bechtolsheim**, founder of Sun Microsystems with responsibility for hardware design from 1982 to 1995, and Vice President Cisco Systems for the past eight years (Tr. 5776-78, 5785-86, 5808-13);

**Mark Kellogg**, a Distinguished Engineer with 29 years of experience at IBM (Tr. 5100-04, 5110-11, 5117-32, 5137-46, 5154-70, 5176-88);

**Terry Lee**, Executive Director of Advanced Technology and Strategic Marketing at Micron with 20 years experience in the field (Tr. 6625-38, 6645-55, 6663-86, 6691, 6710-17);

**Joe Macri**, Director of Engineering at ATI (a manufacturer of graphics controllers) with 18 years experience at Digital Equipment Corporation, Silicon Graphics and ArtX/ATI (Tr. 4760-81 (*in camera*));

**Peter MacWilliams**, Director of Platform Architecture at Intel, with 25 years of experience at that company (Tr. 4918-20);

**Desi Rhoden**, an engineer with 17 years of experience at Hewlett-Packard, VLSI (a chipset manufacturer) and AMI International (Tr. 425-35, 475-77, 505-18);

**Howard Sussman**, an engineer with 27 years of experience at Mostek (a former memory manufacturer), NEC and Sanyo (Tr. 1363, 1370-71, 1379-80).

Every one of these witnesses, and numerous contemporaneous documents, confirmed the viability of specific alternatives to the technologies contained in the standards. CCAB at 82-89.

Rambus hopes the Commission will ignore these leading industry figures, who actually were involved in evaluating these technologies at the time and most of whom participated in the JEDEC selection process. Instead, it offers its experts' unsupported opinions. RB at 61-64. Not only are the assumptions of each contradicted by the record, but the experts compounded their errors by relying on one another.

The testimony of Rambus's technical experts is fatally flawed on at least eight different levels:

1. Rambus's technical experts lack appropriate expertise. Dr. Soderman's expertise is software and non-DRAM devices known as programmable logic. Tr. 9337-44. His last DRAM design experience was in 1978, on a DRAM for typewriters. Tr.

9342-43, 9423-28, DX 296. Mr. Geilhufe has not designed a DRAM since 1978, or contributed to a DRAM design since the 1980's. Tr. 9625-28. His only recent manufacturing experience involved evaluating use of an out-of-date DRAM facility “to produce other products.” Tr. 9628-31.

2. Rambus’s technical experts addressed the wrong question. Mr. Geilhufe admitted he didn’t know whether his analysis corresponded to JEDEC’s method of selecting technologies. Tr. 9622 (“I don’t even know whether the questions I was asked to answer were ever asked at JEDEC”), 9674 (“I have no knowledge of how JEDEC folks did their analysis or if they did an analysis”).
3. Rambus’s technical experts lacked understanding of the JEDEC standards. For example, Dr. Soderman did not understand WCBR.<sup>62</sup> Tr. 9467-69, 9469-70. Similarly, Mr. Geilhufe didn’t fully understand the burst length description in the SDRAM standard. Tr. 9744.
4. Rambus’s technical experts failed to consider much of the evidence. Dr. Soderman apparently failed to review any fact witness testimony. Tr. 9427, 9432-35, 9440, 9450, 9488-89, 9492, 9494, 9499, 9503, 9506-10, 9525-28. He could not recall a single presentation of alternate technologies at JEDEC.<sup>63</sup> Tr. 9484-86, 9490-91, 9493-94, 9498, 9504. Mr. Geilhufe could recall reviewing only the testimony of Dr. Peisl and Henry Becker.<sup>64</sup> Tr. 9619-21 (“Yes, I vaguely remember reading that.”), 9729-31. *See also* Tr. 9440, 9491, 9498, 9503, 9506-07, 9622, 9729.
5. Rambus’s technical experts omitted work essential to reliable opinions. Mr. Geilhufe admitted, “I would have wanted to see cost documents from a number of companies.” Tr. 9617-18. Rambus never conducted discovery to obtain the necessary documents. Tr. 9666-67. Instead of using actual cost information, Mr. Geilhufe used unverifiable estimates, information from web sites and telephone calls to unidentified companies for unidentified parts, and unidentified information derived at some past time from an unidentified company. Tr. 9665 (“All the information is estimated.”), 9693-95, 9697-98, 9711-15.

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<sup>62</sup> JEDEC adopted programmable CAS latency and burst length in part because they were comfortable with the command sequence used to initiate the programming – known as “write-enable, CAS before RAS,” or “WCBR”. Tr. 1382-83 (Sussman); Tr. 5109-10 (Kellogg); CCF 534.

<sup>63</sup> Indeed, Professor McAfee understood the disadvantages of dual-edge clocking better than Dr. Soderman. *Compare* Tr. 7589-90, 9505.

<sup>64</sup> Although Dr. Peisl’s deposition testimony contradicted almost every one of Mr. Geilhufe’s conclusions, this had no effect on Mr. Geilhufe’s opinions. Tr. 9680-91, 9695-96, 9698-9700.

6. Unfamiliar with the record, Rambus's technical experts made fundamental errors in their factual assumptions. For example:
- Mr. Geilhufe allocated design costs over assumed runs of 20 million units per DRAM product, rather than approximately 900 million units, Tr. 10997-11002, thus inflating his estimates of design costs by as much as a factor of 45.
  - Mr. Geilhufe assumed that an on-module PLL would cost \$3.80 per unit, instead of {{ }} (*in camera*), Tr. 11179, inflating this cost by {{ }} (*in camera*).
  - Mr. Geilhufe assumed that alternatives would have had to accommodate 12-15 combinations of CAS latency/burst length, rather than one or at most four (Tr. 11002-08, 11013-15, 11018-19), thus inflating these cost estimates by 3-12 times.
  - Dr. Soderman erroneously assumed DRAM manufacturers do not use electrically-blown fuses. Tr. 9441. However, {{ }} (*in camera*).
  - Dr. Soderman and Mr. Geilhufe both assumed that additional pins, and thus cost, would be required to set CAS latency and burst length. In fact, two unused pins were available (one to set latency, one to set burst length). Tr. 11026-37 (Lee); Tr. 11104-06 (Jacob).<sup>65</sup>
7. The results of Rambus's technical experts' analysis cannot be verified. Mr. Geilhufe suggested a DRAM manufacturer might be able to verify his model, but he made no effort to have one do so. Tr. 9665-67.
8. Rambus's technical experts' conclusions require finding that Samsung, Mitsubishi, Cray, Sun Microsystems, Micron, IBM, Silicon Graphics, Intel and Texas Instruments, among others, acted irrationally by deliberately proposing or supporting allegedly inferior and more expensive technologies at JEDEC. Indeed, if Dr. Soderman is correct that dual-edge clocking had no disadvantages whatever, Tr. at 9505, the entire JEDEC membership acted irrationally in rejecting use of dual-edge clocking for the SDRAM standard.

Dr. Rapp, Rambus's principal economic expert, incorporated the errors of Dr. Soderman and Mr. Geilhufe (Tr. 9778-79), and added his own.

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<sup>65</sup> For evidence of 25 specific erroneous assumptions made by Dr. Soderman, Mr. Geilhufe, or both, *see generally* Tr. 10995-11055, 11161-79 (Lee) and 11101-24 (Jacob).

First, Dr. Rapp premised his analysis on a determined ignorance of how JEDEC operates. CCFE 2828-31, 2835-45, 2851; CCRF 726-28.

Second, Dr. Rapp failed to analyze viable alternatives for programmable CAS latency/burst length and dual-edge clocking because Dr. Soderman opined that they infringed Rambus's patents.<sup>66</sup> CCFE 2872-76. Dr. Rapp thus never analyzed the least expensive alternatives to programmable CAS latency and dual-edge clocking, and the second-least expensive alternative to programmable burst length. Tr. 11252-66; DX 366-67.

Third, Dr. Rapp failed to distinguish between royalty and manufacturing costs. CCFE 2860. In the DRAM industry, manufacturers typically can drive costs down substantially over time. Royalty costs, by contrast, are outside the manufacturer's control, are subject to hold-up after lock-in occurs, and do not decline over time. CCFE 2861-62. Consequently, Dr. Rapp overstated the future manufacturing costs of alternatives in comparison to royalty-burdened designs. CCFE 2870, 2879-83.

Finally, Dr. Teece adopted the errors of Rambus's other experts (Tr. 10365), and added yet more. *See, e.g.*, Tr. 10370-71 (“[A] technology that is price-constraining is certainly not an economic substitute.”).

The Commission should disregard these experts' conclusions that JEDEC would have selected the four technologies at issue regardless of Rambus's patent rights. The contemporaneous documents and testimony of numerous highly-experienced engineers with first-hand knowledge show that JEDEC had multiple acceptable alternatives that it considered in choosing its standards. Had JEDEC known of Rambus's patent rights, it plainly could have

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<sup>66</sup> Dr. Soderman's opinion is inherently unreliable and actually demonstrates that Rambus's patents don't cover the alternatives. *See* pages 71-72 *infra*.



selected alternative technologies. CCAB at 89-100.

**c) Rambus Failed to Present Credible Evidence of Blocking Patents on Alternatives.**

Rambus failed to present any credible evidence that it or others hold blocking patents relating to some of the potential alternatives identified at trial. *See* RB at 80.<sup>67</sup> Relying entirely on the testimony of Dr. Soderman, Rambus argues that its patents might have covered three of the 23 potential alternatives identified at trial – scaling CAS latency with clock frequency, using a pin to set burst length, and identifying burst length in the read command. Tr. 9359, 9371-74. These assertions have no merit for multiple reasons.

First, Dr. Soderman admitted that others were better qualified to determine infringement. Tr. 9457-58.

Second, in contrast to the element-by-element claim analyses of Professor Jacob and Mr. Nusbaum, Dr. Soderman performed virtually no claims analysis whatsoever. Tr. 9359 (storing information on a DRAM is “like a mode register. That’s one of the things that is covered under the Rambus patents.”); 9372-73 (“It just says receiving block size information the memory device responds by generating a certain number of bits. So it’s covered by this.”). Also unlike Professor Jacob and Mr. Nusbaum, Dr. Soderman neither followed the standard practice of consulting technical dictionaries, treatises, and other standard works (Tr. 9478-79) nor checked whether his results were consistent with the patent specifications. Tr. 9466.

Third, Dr. Soderman’s testimony disproves Rambus’s argument. Each claim he

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<sup>67</sup> Rambus wrongly assumes that any patent applicable to an alternative would permit the patent holder to capture the same degree of monopoly power as the Rambus patents covering the adopted technologies. This does not follow. The validity of a patent applicable to an alternative might be susceptible to challenge (for example, if there is prior art in the field), or infringement might be unclear, thus either defeating altogether any attempt to extract royalties or permitting negotiation of greatly reduced royalty rates.

identified contains the term “operation code,” which is part of the “protocol packet” transmitted to the DRAM. Tr. 9456-57. Thus, his own interpretation establishes that the claims in question are limited to a packetized system, such as RDRAM, and do not apply to SDRAMs.<sup>68</sup>

Rambus also alludes to alleged patents of third parties (RB at 64), but its evidence is virtually non-existent. Rambus failed to establish that the alleged third-party patents even apply to any alternatives, let alone whether they are blocking or implementation patents. Furthermore, Rambus incorrectly assumes that a third-party patent would automatically disqualify an alternative. Even if an alternative were covered by a third party’s blocking patent, it could be a viable if the royalty charged were less than that charged by Rambus. Any patents held by a manufacturer with extensive cross-licenses would present no obstacle, since most companies would have royalty-free use of the patent.

**d) JEDEC Members Would Have Adopted Alternatives.**

Rambus asks the Commission to step into JEDEC’s shoes, “deconstruct[] the decision-making process” (RB at 118), and determine how JEDEC would have analyzed competing technologies. Rambus in effect asks the Commission to relieve it of liability by reaching a hypothetical conclusion that 60+ engineers, representing companies with widely differing interests, viewing a number of highly technical options for achieving a particular objective, would have reached precisely the same outcome if Rambus had permitted competition to operate effectively. CCAB at 77-103.

The Commission should not attempt to substitute its judgment for that of JEDEC, and

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<sup>68</sup> Dr. Soderman also assumed that some burst-length alternatives required a register, which is “like a mode register,” some of which are covered by Rambus patents. Tr. 9359. In fact, the alternatives required a latch, not a register (Tr. 5393 (Jacob); Tr. 5126-27 (Kellogg)) which would not be covered by Rambus patents.

determine what course of action it thinks JEDEC members would have followed had Rambus made timely disclosures. Even accepting this invitation to second-guess the JEDEC process, however, Rambus's arguments do not hold up to scrutiny as a matter of logic or evidence.

**i) Rambus's Misinformation and Failure to Disclose Led JEDEC Members to Believe Rambus Had No Relevant Patent Claims.**

*I don't believe we ever specifically stated that we had intellectual property that applied to – outside of the Rambus-compatible area.*

*CX2070 at 47 (Deposition of Gary Harmon)*

*Q When was the first time that you know of that Rambus advised any sync DRAM manufacturers that Rambus had claims that covered features of sync DRAMs?*

*...*

*A I think it was in 2000. Maybe 1999, but I think 2000.*

*CX2079 at 157 (Deposition of David Mooring)*

Rambus's argument that "DRAM manufacturers and others were put on notice of the nature of Rambus's inventions" (RB at 36-38) is contradicted by the overwhelming weight of the evidence. Rambus's invention, as described by Rambus to industry participants and in Rambus's publicly-available PCT application, was a narrow-bus, multiplexed, packetized system that was fundamentally different from JEDEC work. CCAB Attachment 1; CX3132 at 256-58 (Farmwald); CX2086 at 191 (Crisp); CX2070 at 38 (Harmon). Nothing notified JEDEC members that Rambus would seek or had filed claims covering technologies used in JEDEC's wide-bus, non-multiplexed, non-packetized architecture. CX2109 at 150 (Davidow); CX2070 at 47 (Harmon); CX2079 at 157 (Mooring); CX2074 at 504-07 (Tate); Tr. 8732-33 (Hampel); Tr. 521-22, 400-04 (Rhoden); Tr. 1019-20 (Calvin); Tr. 1431, 1435-36, 1439, 1454-55 (Sussman); Tr. 2537-38, 2546, 2562 (G. Kelley); Tr. 4431 (Peisl); Tr. 5050, 5053 (Kellogg); Tr. 5813-14,

5824, 5828-29 (Bechtolsheim); Tr. 6348, 6385-86 (Appleton); Tr. 6602-04, 6610-11 (Lee); CX2089 at 147-48, 152 (Meyer); CX2107 at 69, 76-77 (Oh); *see also* Tr. 3686-87 (Heye); Tr. 5460-5502 (Jacob: explaining why engineers wouldn't have understood that Rambus's patent application supported claims covering SDRAMs or DDR SDRAMs); CX1320 at 1, 5; CX1309 at 28; CX1069; CCAB at Attachment 1.<sup>69</sup> Indeed, even Richard Crisp first thought Rambus's patent application was designed to cover RDRAM and was limited to narrow configurations with shared data and address lines, a packetized bus, and a loop clock; only later (apparently when he started working with patent counsel in 1992) did he understand that it could also cover features in other architectures. Tr. 2926-28.

Effectively conceding that industry members did not in fact understand the scope of Rambus's potential patent rights, Rambus argues that the Commission should infer, *as a matter of law*, that the availability of the '898 application satisfied Rambus's JEDEC disclosure requirement. Rambus bases its argument on Complaint Counsel's alleged concession that Rambus's patents are valid and satisfy the written description requirement of 35 U.S.C. § 112. RB at 39-40.

Rambus's theoretical argument misinterprets the written description requirement. The specification portion of an application contains a written description of the invention and its uses in general terms, and often describes the invention in the context in which it will be used. Patent claims in the same or later application that claim priority based on the original application must be based on the description contained in the original specification. But as Rambus's own patent

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<sup>69</sup> One exception was Intel; in late 1997 or 1998, Rambus informed Intel that it "might have some patent applications that related to DDR technology." But because Rambus said "nothing concrete," with "no specifics on what they had patent applications on," Intel could do little with the information. Tr. 4905 (MacWilliams).

expert explained, it does not follow that a knowledgeable engineer reviewing a specification could predict all the elements of the invention that may be patentable, or what limitations may be necessary to make the elements patentable. Tr. 8903 (Fliesler); *see* CCFE 1277-78; CCRF 706.

The actual claims – which set the metes and bounds of the patent rights – provide crucial information that cannot be discerned from the specification alone, and the description of the invention from Rambus’s ‘898 application could not inform JEDEC members of the scope of Rambus’s potential patent claims. CCRF 94-95; CCFE 1278; Tr. 8901-02 (Fliesler).

Rambus also argues that because a few JEDEC members, at different times, in response to different rumors, were “aware of [the] prospect” that Rambus might obtain patents concerning different technologies, JEDEC as a whole must have had accurate knowledge of the potential scope of Rambus’s patents and nevertheless adopted the technologies in question. RB at 36-42. Even accepting at face value Rambus’s evidence,<sup>70</sup> Rambus asks the Commission to assume, despite evidence to the contrary, that (1) a vague suspicion is equivalent to knowledge; (2) a marketplace rumor is equivalent to an informed disclosure; (3) concern about one technology is equivalent to information about all Rambus technologies; (4) concern by a few companies is equivalent to knowledge by all 60+ JC-42.3 members;<sup>71</sup> and (5) JEDEC would have disregarded

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<sup>70</sup> Rambus’s evidence is questionable. For example, Rambus’s argument concerning Mitsubishi (RB at 40-41) relies on Rambus’s interpretation of largely handwritten Japanese documents, of which only small portions were translated by a translator who apparently had trouble reading the document, and as to which no witness ever testified who had any knowledge concerning the preparation of the document or the subject matter. *See* RX 406; RX 2214A; RX2213A; CCRF 671-72, 676-77.

<sup>71</sup> There is no evidence that any of the following JC-42.3 Committee members suspected that Rambus patents might apply to ongoing JEDEC work:

3DO	Motorola
Advanced Micro Devices (AMD)	National Semiconductor
AMP Inc.	Nippon Steel

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its own rules and adopted the relevant technologies despite Rambus's unwillingness to commit to RAND terms. None of these assumptions is supportable. *See* CCAB at 96-100.

In fact, the evidence confirms that information regarding the scope of Rambus's patent rights was highly material to JEDEC members, and those with suspicions about Rambus patents were misled by Rambus's omissions and misstatements. Each of the five current major DRAM manufacturers relied on Rambus's omissions or misstatements, each in a different way.

Willi Meyers of Infineon (formerly part of Siemens) raised concerns about Rambus patents, focused primarily on dual-bank technology, at the May 1992 JEDEC meeting. When

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Apple Computer	Northern Telecom
Augat	Panasonic
Cirrus Logic	Philips
Cisco Systems	PNY Electronics
Compaq	Quality Semiconductor
Cray Research	Raytheon
Cubic Memory	S3
Cypress	Sanyo
Data I/O	Semiconductor Insights
Digital Equipment Corp.	SGS Thomson
Electronic Designs	Sharp
Eltron Tech Inc.	Silicon Graphics
EMC Corp.	Silicon Storage Tech.
Fujitsu	Smart Modular
Harris	Sony
Hitachi	Sun Microsystems
Hyundai	Teradyne
IDT	Texas Instruments
Kingston Tech	Unisys
LSI Logic	Vanguard
Memory Strategies	VLSI
Microchip Tech	Western Digital
Mosel Vitalic	Xerox
Mosaid	Xilinx

JX0027 at 1-3; JX0028 at 1-3. Had Rambus disclosed, even a small number of these members could have prevented JEDEC from adopting the Rambus technologies. CCFF 249-50, 254-55.

asked whether Rambus had anything to say, Richard Crisp shook his head “no.” CCF 902-909. Thereafter, Mr. Meyer watched Rambus representatives attend meetings, observe Mr. Townsend’s patent presentations, vote on ballots, and participate through the final adoption of the SDRAM standard, all without making any patent-related disclosure. Mr. Meyer also observed Mr. Crisp disclose Rambus’s ‘703 patent, which did not impact JEDEC’s SDRAM work. CX 2089 at 147-48 (Meyer). From this, Mr. Meyer concluded that Rambus “seemed to follow the [JEDEC disclosure] policy,” that it “had nothing to report which related . . . to the work of our committee,” and that JEDEC had “managed to define a public domain version” SDRAM standard that was not “covered by somebody’s intellectual property.” *Id.* at 149, 151-52. Mr. Meyer documented his understanding in a presentation in October 1993. *Id.*

In 1993, Mitsubishi (today part of Elpida) reviewed Rambus’s international PCT patent application. RX2213A. Somebody apparently noted that a claim in the application covered programmable access time in RDRAMs, with some similarity to programmable CAS latency in SDRAMs. *Id.* at 27. Absent any Rambus disclosure, however, Mitsubishi apparently concluded that Rambus’s patent rights were limited to the unique RDRAM narrow-bus architecture. In January 1997, Mitsubishi urged the SyncLink Consortium: “Concentrate on wide-bus approach. Narrow-bus is Rambus look alike.” RX0853 at 1.

In 1994, Samsung apparently worried Rambus might have patent rights somehow relating to SDRAMs. During license negotiations, Samsung insisted that it obtain some protection from Rambus IP beyond RDRAMs. Rambus reluctantly agreed. CX0763; CX0765 at 1-2. Samsung received protection against unintentional infringement in SDRAMs, and other products. CX1592 at 19. By 1996, however, absent a Rambus disclosure relating to SDRAMs or future SDRAMs (CX0770), Samsung accepted a renegotiated license restricted to RDRAM uses only.

Had Samsung retained its broader rights from its 1994 agreement, it would not have been subject to patent ambush in 2000.

In 1995, after Rambus said it might have patents relating to SyncLink, Hynix (then known as Hyundai) negotiated rights to use Rambus technologies in “Other [non-RDRAM] DRAMs.” CX1599 at 3, 12. Although Hynix focused on SyncLink, this agreement would have capped royalty rates for DDR SDRAMs. CCFF 1264-65, 1544-53. In 1999, however, Hynix merged with Lucky Goldstar. {{

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CX2105 at 265-68 (Mooring) (*in camera*). With SyncLink effectively dead, and Rambus having provided no indication that its patents had any relevance to SDRAMs or DDR SDRAMs, {{

}} *Id.* Within months, Rambus accused Hynix of patent infringement (CCFF 1956), later seeking treble damages and an injunction to prohibit Hynix from manufacturing JEDEC-compliant DRAMs. CCFF 2019.

In April 1997, Micron heard a rumor from a low-level graphics engineer at Intel that Rambus might have patents relating to dual-edge clocking as proposed for DDR SDRAMs. *See* RX0920. Micron insisted that SSO’s take particular care to avoid Rambus patents. CX0488 at 2. That same month, responding to a JEDEC proposal resembling the loop-back clock in Rambus’s previously disclosed ‘703 patent, Terry Lee of Micron proposed an alternative clocking scheme specifically to avoid that patent. Tr. 6697-99 (Lee); CX0368 at 2. Terry Lee did not pursue the rumor from the Intel graphics engineer because Rambus had said nothing at JEDEC, where it had an obligation to disclose such patent rights, or during the Rambus-Micron license negotiations, when they had an economic incentive to do so. Tr. 6700-09 (Lee).

Contemporaneous documents capture the result of DRAM manufacturers’ reliance on



Rambus's omissions and misrepresentations: they believed that SDRAM and DDR SDRAM were free of patents and royalties. For example, a 1998 Micron presentation describing DDR SDRAM explained "Why DDR Is Cost Effective:" the top reason was "No Royalties." CX2726 at 7; *see also* CX2737 at 56. Similarly, Hynix documents from 1997 list DDR SDRAM strengths, including "Most cost effective next generation DRAM – Open architecture without royalties or fees." CX2294 at 15; CX2297 at 79; *see also* CX2264 at 2 ("open standard spec:" Direct RDRAM "poor", DDR SDRAM "good"); CX2303 at 16, 18 ("Open Standard (JEDEC)"); CX2334 at 25, 27. An Infineon presentation provides a side-by-side comparison describing Rambus as "Proprietary standard of Rambus/Intel ==> payment of royalties," but DDR SDRAM as "Open standard ==> no royalties." CX2451 at 9; *see also id.* at 13. Witnesses confirmed that these documents accurately reflected their companies' understanding that JEDEC's standards were open and patent-free. *See, e.g.*, Tr. 4430-31 (Peisl: Infineon understood that JEDEC's standards were open, "free, [and] could be used by everyone without any royalty payments."); Tr. 4472-73 (Peisl: Infineon believed "the JEDEC standard doesn't include any royalties"); CX2107 at 136-38 (Oh: Hynix understood that DDR SDRAM "requires no royalty or no fees at all,"); *id.* at 158-60. The evidence is fully consistent: Whatever isolated, occasional suspicions a few individuals may have had, Rambus's scheme was successful: JEDEC members failed to understand that the JEDEC standards would be subject to Rambus patents until late 1999 or 2000, when Rambus launched its enforcement campaign. Tr. 1454-55 (Sussman, NEC/Sanyo); Tr. 2593 (G. Kelley, IBM); Tr. 528-29 (Rhoden, Hewlett-Packard/VLSI); Tr. 5880-81 (Bechtolsheim, Sun); Tr. 6384-85 (Appleton, Micron); CX2108 at 229-30 (Oh, Hynix).

**ii) Three Individuals' Speculation About Prior Art Says Nothing About JEDEC's Likely Response to a Rambus Disclosure.**

Rambus asks the Commission to assume that, because three witnesses speculated about possible prior art relevant to certain aspects of Rambus's patents (RB at 41-42), that (1) those three witnesses were convinced that prior art would protect JEDEC work against Rambus patents, (2) a disclosure by Rambus would not have inspired any further investigation by those individuals, (3) those companies' legal departments and management would not have investigated, (4) all other JEDEC members and their companies would have done the same, and (5) JEDEC would have abandoned its rule prohibiting adoption of patented technologies without considering technical justification or a RAND commitment. The last two assumptions are facially implausible and lack record support; the first three are easily disproved.

Howard Sussman's testimony disproves the first assumption. Based on what he heard from Rambus and his own brief review, Mr. Sussman thought that Rambus's key inventions were a packetized system, a loop-back clock, and a low-voltage CMOS driver. Tr. 1431-36. Nothing caused Mr. Sussman to understand that Rambus would pursue claims independent of these three key features. Tr. 1445-46, 1453-56. Absent any specific disclosure to the contrary, Mr. Sussman's general understanding of prior art confirmed that these were the key Rambus innovations and likely patented technologies. Had Rambus disclosed the scope of its potential patent rights, Mr. Sussman would have favored alternative technologies. Tr. 1416-17.

Micron representatives' actions disprove the second Rambus assumption. When NEC proposed to use a return clock similar to the loop-back clock in Rambus's '703 patent, Micron representatives (who were aware of prior art) did not rely on that prior art and permit the proposal to proceed. Rather, as discussed below, Micron (along with many others) insisted that

JEDEC drop the proposal.

The actions of Infineon and Micron regarding RDRAM disprove Rambus's third assumption – that companies' management and legal departments would have relied on prior art. Despite speculation about the validity of Rambus's patents, Infineon and Micron signed license agreements and paid to use those patents. CX1617; CX1646.

**iii) Reactions in 2000 Do Not Reflect How JEDEC Would Have Reacted in the Early-to-mid 1990's.**

The clearest evidence of JEDEC's likely reaction to a Rambus disclosure is the natural experiment inadvertently set up by Rambus's disclosure in 1993 of its '703 patent at JEDEC. In March 1997, when NEC proposed a return clock resembling the loop-back clock in Rambus's '703 patent, JEDEC members rejected the proposal. CCAB at 91; Tr. 6692-99 (Lee: "It looked like the '703 patent . . . and I objected that I thought this . . . looked similar to the Rambus patent. Many other people in the room also objected."); Tr. 527-28 (Rhoden); CX0368 at 2.

Rambus asks the Commission to ignore this natural ex-ante experiment, and instead rely on the industry's ex-post decision not to change technologies in the DDR2 standard after having spent 3-5 years planning for, designing and manufacturing DRAMs, components and end-products using the technologies in SDRAM and DDR SDRAM, and having spent almost two years further building upon these technologies in the DDR2 standard. The DDR2 standard in fact disproves Rambus's lock-in argument – despite the previous existence of viable alternatives, by 2000 the majority of JEDEC members had become committed to using and building upon the four technologies in question.

The record demonstrates that:

- JEDEC began DDR2 standard-setting work in April 1998 (CCFF 3230-31);

- JEDEC planned that DDR2 would be DDR-based and incorporate the technologies of DDR SDRAM (CCFF 3236-37);
- JEDEC’s overarching goal was to maintain compatibility with SDRAM and DDR SDRAM to facilitate adoption of the new standard (CCFF 3244-50);
- by 2000, certain DRAM manufacturers and component manufacturers had sunk substantial costs into the developing DDR2 standard (CCFF 3238-43, 3252, 3255, 3257-58); and
- JEDEC members were concerned that changing the DDR2 standard to avoid Rambus’s patents would have delayed the standard substantially, jeopardizing industry adoption (CCFF 3231, 3251-61).

Specifically, the record shows that, beginning in 1998, the DDR2 committee used the DDR SDRAM standard as the basis for DDR2 because of the need for backward compatibility. CX0397 at 2 (describing DDR2 as an “Evolutionary design, building on tradition of [SDRAM] and DDR SDRAM”); CX2717 at 8 (“Need to overlap generations, e.g. SDR[AM] to DDR, therefore change [DDR2] must be evolutionary”),<sup>72</sup> *id.* at 13 (“One controller supports DDR and [DDR2]”); Tr. 408 (Rhoden: The industry “wanted to base [DDR2] off of the current generation memory” and “use[d] DDR as the baseline”); Tr. 5191-93 (Kellogg: IBM wanted “a level of consistency” between DDR and DDR2); Tr. 4611-13 (Macri: “We [didn’t] want to change everything such that when you would design a new system for [DDR2], that it would be absolutely incompatible with the past.”); Tr. 6771-72 (Lee).<sup>73</sup>

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<sup>72</sup> The advantages of evolutionary standards are described in the record: Tr. 3977 (Polzin: easier to improve performance by “tweaking the design a little bit over time” than by “throwing everything out and starting over again”); RX1839 at 8 (“Evolutionary allows infrastructure to advance at a natural pace.”); *see also* Tr. 4378-79 (Peisl: evolutionary design kept the costs down for the industry generally), 4429; Tr. 6759-60 (Lee: SDRAM to DDR SDRAM was an evolutionary improvement; a chipset could support both); Tr. 408 (Rhoden: “we just evolve one to the next, to the next, with as little changes as possible, because it’s much easier to bring the whole industry along when you make minor changes.”)

<sup>73</sup> Rambus argues that the Committee’s mere consideration of alternative starting points for DDR2 proves that backwards compatibility was not a significant goal. RB at 57-58.

Two years later, proposals to switch technologies in the DDR2 standard were rejected because they would have disrupted DDR-DDR2 compatibility and companies' ongoing DDR2 design work. Tr. 4633-35 (Macri) (programmable CAS latency, burst length, dual-edge clocking and on-chip DLL in DDR2 because they were in DDR SDRAM), 4623-24 (DDR2 preserved DLL for backward compatibility), 4641-42 ("I wanted to keep the same [dual-edge] clocking scheme [for DDR2] that DDR1 had for compatibility reasons"), 4647 (different clocking "is a huge incompatibility"), 4649-50 (switching technologies would have forced companies to redesign); Tr. 6801-03 (Lee: single-edge clocking rejected because "it wasn't like DDR"); Tr. 5199-5201 (Kellogg: change to single-edge clocking would have delayed schedule and been a significant change from DDR); Tr. 4454-55 (Peisl: changing DDR2 would have been painful for companies already designing in that direction).

Rambus also cites to the development of RLDRAM (RB 59-60), a non-standardized niche product with sales volumes that do not even register in DRAM market calculations. Tr. 7427-31 (McAfee); Tr. 5866-67 (Bechtolsheim); DX 141; DX 219. The price of RLDRAM is "several times higher than commodity DRAM." Tr. 5870 (Bechtolsheim). RLDRAMs have higher performance, and are used in specialty applications, such as high-speed routers. Tr. 5867, 5870-71 (Bechtolsheim). Willingness to use patented technologies for small-volume, high-performance niche products says nothing about the industry's willingness to use patented

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In fact, the Committee did not "waste time" considering other options. *Id.* A consensus for using backwards-compatible technologies was reached at the very first meeting, and the matter was settled by the second meeting in the summer of 1998. CCF 3236-37.

Rambus argues that JEDEC would not have tentatively adopted fixed burst length for DDR2 had backwards compatibility been a concern. RB at 58. But the record is clear that the committee reversed this decision and reinstated programmable burst length specifically because it discovered that use of fixed burst length would have caused backward-compatibility problems. CCF 3243, 3251-53.

technologies in high-cost, high-volume, low cost commodity DRAMs.<sup>74</sup>

In sum, the law does not require the Commission to trace a chain of but-for causation and determine exactly what JEDEC and its members would have done had Rambus disclosed. Evidence that the patent-related information concealed by Rambus was material to JEDEC and its members in selecting among various alternatives is sufficient to establish liability. Should the Commission desire to determine how JEDEC would in fact have reacted had Rambus disclosed, the best evidence is provided by the reaction of the same 60 JEDEC members to the potential relationship of Rambus's '703 patent with claims covering the loop-back clock: JEDEC promptly acted to avoid Rambus's patent.

e) **Rambus's Argument That Its Royalties Are Consistent With RAND Lack Any Reasonable Basis in the Record.**

Rambus also argues, relying almost entirely on Dr. Teece, that at most, JEDEC would have required Rambus to commit to RAND, that Rambus would have agreed to RAND, that no JEDEC member would have negotiated royalty rates in advance, and that Rambus's royalty rates today are reasonable. As a result, asserts Rambus, its royalty rates had it disclosed would be identical to those charged by Rambus today. RB at 69-74.

Rambus errs at every step in this argument. As explained at pages 64-66 *supra*, Rambus's assertion that it would have provided JEDEC with a RAND commitment is directly contrary to the evidence. The record also demonstrates that other steps in the reasoning are

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<sup>74</sup> Additionally, non-standardized niche products generally adopt as many features of the standard as possible. Mr. Wagner explained that when Nvidia defines non-standardized devices, "[w]e try to make them as close as possible to whatever the next standard in JEDEC is going to be." Tr. 3835-36. Thus, when Nvidia defined its GDDR2 DRAM, another specialty DRAM, it incorporated the main features of DDR2. Tr. 3837-38 (Wagner); *see also* Tr. 3845-47 (Wagner: Nvidia wanted to "take advantage of the same basic technologies that [] JEDEC was working on for their next generation. We wanted to be compatible in general with what JEDEC was doing").

contradicted by the evidence.

**i) JEDEC Would Have Selected Alternate Technologies.**

JEDEC's clear preference was to avoid patented technology whenever possible. CX0208 at 19; JX0054 at 9; CX0903; Tr. 2396 (G. Kelley); Tr. 6598 (Lee). While JEDEC could use patented technology "if technical reasons justify the inclusion" (CX0208 at 19), such a decision had to be based on the specific technology and alternatives available. Tr. 1868-69. It is impossible to extrapolate from a JEDEC decision regarding one technology, with its own specific attributes and alternatives, what JEDEC would do with respect to a completely different technology, with totally different attributes and alternatives. Indeed, JEDEC reached very different decisions with respect to different technologies: in some instances, JEDEC adopted a patented technology subject to a RAND commitment because of the technical merit of that particular technology, whereas in other instances JEDEC rejected a patented technology and instead adopted an alternative. Tr. 5046-49 (Kellogg); CX3135 at 104-05 (Chen).

For each of the technologies in question, multiple alternatives existed. CCAB at 82-89. For each Rambus technology, witnesses saw no technical reasons that required its inclusion in the standard; had Rambus's patent position been known they would have selected alternatives. Tr. 1416-17 (Sussman); Tr. 9022-23 (Prince); Tr. 6635-36, 6717, 6686 (Lee); Tr. 5135-36, 5146, 5170, 5187 (Kellogg); CX2107 at 137 (Oh); CX2058 at 224-25 (Meyer).

Rambus also asks the Commission to assume that JEDEC members would have reacted identically to a patent held by Rambus or any other JEDEC member. The evidence shows otherwise. Although JEDEC members preferred avoiding all patents, they nevertheless had less concern about patents held by manufacturing companies, because most members could obtain royalty-free or low-cost cross-licenses that would allow inexpensive access to the patent. Tr.

6716-17 (Lee). By contrast, JEDEC members were particularly concerned about patents held by licensing companies, which would most likely require significant royalties, and were particularly wary of Rambus's reputation for charging very high royalty rates. Tr. 6337-38 (Appleton); Tr. 7045-48 (Lee); RX0488A at 1; CX1041 at 2. Hence JEDEC's reaction to NEC's return clock presentation; when confronted with a technology potentially covered by Rambus's patents, JEDEC members didn't seek RAND assurances – they sought alternative technologies.

**ii) Some JEDEC Members Likely Would Have Negotiated Ex-Ante.**

Relying on the opinion of Professor Teece, Rambus argues that, had it disclosed, no prior negotiations over royalty rates would have occurred. RB at 71-72. However, Professor Teece failed to consider the specific factual circumstances.

First, contrary to Dr. Teece's opinion, prior negotiations regarding patent applications do occur, even in connection with standard-setting. *See, e.g., Townshend v. Rockwell Int'l Corp.*, 2000 U.S. Dist. LEXIS 5070, \*3-\*7 (N.D. Cal. 2000) (patent-holder negotiated license before the issuance of patents).

Second, prior negotiations were likely because DRAM manufacturers were already negotiating RDRAM licenses with Rambus. Many DRAM manufacturers were concerned about inadvertently exceeding the limited scope-of-license proposed by Rambus (CX2079 at 84-85 (Mooring)) and would have insisted on broader licenses had Rambus disclosed. CCAB at 101-02.

**iii) The Royalties Demanded By Rambus Are Far From Reasonable.**

=> *JEDEC would license @ 1% royalty*

*CX1941 at 1 (handwritten notes of Lester Vincent, 3/25/92)*



Relying again on the unsupported opinions of Dr. Teece, Rambus argues that the royalty rates it has collected, and the yet-to-be-announced royalty rates for its litigation opponents if it prevails, are reasonable. RB at 72-74.<sup>75</sup> Dr. Teece's reasoning was flawed. His conclusions have no bearing on the particular patents or technologies at issue here, because they were based entirely on royalty rates for other patents, of unknown strength, covering unidentified technologies, that might or might not have had available alternatives, negotiated between largely unidentified companies, for products of unknown volume, in unknown market situations. As Rambus's CEO explained, such an approach has no validity:

. . . it's apples and oranges. The royalty rate for one patent and the royalty rate for another patent, even in the industry, can vary tremendously based on the value of the patent and the [technical] applications involved.

CX2060 at 158 (Tate).

Dr. Teece's simplistic comparison of royalty rates for unrelated patents and technologies in different circumstances leads to unreliable results. As one example, the technologies covered by Rambus's patents make up only a portion of an SDRAM or DDR SDRAM, but Rambus collects a royalty based on the selling price of the entire DRAM. This is equivalent to charging a royalty for anti-lock braking technology based on the selling price of the entire automobile. Thus, Rambus's effective royalty rates on the four technologies themselves are far higher than the percentage rate on the entire DRAM. Yet Dr. Teece failed to control for this critical factor.

The evidence specific to these technologies, used in high-volume commodity DRAMs,

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<sup>75</sup> This assumes that Rambus would even offer a license to its litigation opponents, which is by no means clear. *See* CX2109 at 106 (Rambus Chairman Davidow: "I was an advocate of not licensing this technology too broadly").

by these same companies, and in this market, indicates that royalty rates would have been far lower before industry lock-in. The evidence of reasonable royalties for high-volume RDRAMs<sup>76</sup> ranged from 0.1% to 1.5%,<sup>77</sup> with a cluster between 0.5% and 1%.<sup>78</sup> The four relevant technologies were only a subset of the technologies used in RDRAM, and a license for SDRAMs did not involve any Rambus support or know-how. Thus, the reasonable royalty rate for SDRAMs and DDR SDRAMs would have been substantially less than the rate for RDRAMs. The evidence specific to these technologies indicates that the pre-lock-in royalty rate for SDRAMs and DDR SDRAMs – assuming that JEDEC had not selected alternate technologies – likely would have been significantly less than 0.5%.

**B. Rambus Possesses Durable Monopoly Power in the Relevant Technology Markets.**

Rambus says the industry is not locked in to the JEDEC standards. RB at 74-79. Asserting that DRAM manufacturers, component manufacturers and OEMs could all switch technologies smoothly, efficiently and painlessly, Rambus asks the Commission to ignore the vast evidence that replacing the four technologies would cost DRAM manufacturers, component manufacturers and users huge amounts of money, cause substantial delays in the introduction of

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<sup>76</sup> Companies often agreed to higher rates for small volumes, but insisted on lower rates for high-volume commodity products. Rambus's license agreements sometimes contained a sliding scale, with the royalty rate declining as volume increased. Because SDRAMs and DDR SDRAMs are the highest-volume DRAM products in the market, the lowest volume-adjusted rates would be appropriate. CCF 108-11, 2453, 2462.

<sup>77</sup> CX0855 at 1; CX1612 at 5.

<sup>78</sup> CX0952 at 2 (“they [Intel] want us to have license deals that . . . have long term reduction of royalty based on volume going to less than ½% for rdrams . . . we are encouraging them [to invest in alternative solutions] at our 1%+ royalty levels”); CX0961 at 1 (meeting regarding Intel request “to lower our rdram royalties to <0.5%”); CX1592 at 23 (Samsung license agreement: 1.0% royalty on all units over 10,000,000; after 5 years, 0% royalty).

new products, and create significant inefficiencies due to the loss of evolutionary development and backwards compatibility. CCAB 65-71.

Rambus's argument borders on the comical, considering that its business strategy was fundamentally premised on the fact that the industry would be locked in to the JEDEC standard, and that, as Rambus's CEO said, "our leverage is better to wait." CX0919.

### **1. Rambus's Arguments Rely on Flawed Assumptions and a Misunderstanding of Lock-In.**

The record is uncontested that in 2000, after learning that Rambus was asserting patents against JEDEC-compliant products, certain industry members proposed switching technologies in JEDEC standards to avoid Rambus's patents. Tr. 532-33 (Rhoden); Tr. 6777-78 (Lee). Those efforts failed. Tr. 533 (Rhoden); Tr. 6785-86, 6793 (Lee). Most JEDEC members, including IBM, Hewlett-Packard, AMD, Nvidia and {{ }} (*in camera*), opposed proposals to change technologies. Tr. 5198-5200 (Kellogg); Tr. 2781-84, 2794-95 (Krashinsky); Tr. 3732, 3733-34 (Heye); Tr. 3862-63, 3869 (Wagner); Tr. {{ }} (*in camera*); *see also* Tr. 5881-82 (Bechtolsheim: concern about impact on Cisco of switching technologies); Tr. 4443-44 (Peisl); CX2108 at 231-32 (Oh). The resistance was not to the technologies themselves, but rather to the disruption, costs and delays that switching would cause.

Rambus nevertheless insists that the industry theoretically could still switch.<sup>79</sup> Rambus's hypothetical arguments are misplaced, for multiple reasons.

First, Rambus ignores the type of changes involved. Adding new features to create a new

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<sup>79</sup> Rambus obscures the central issue: would switching technologies now be sufficiently more difficult, costly or time-consuming – compared to adopting different technologies initially – that companies would be willing to pay higher royalties ex-post. There is no dispute that companies could switch; the issue is the cost of doing so.

standard, although not easy, is far less difficult than subtracting or replacing features that companies have come to rely upon. Tr. 4449-57 (Peisl); Tr. 3993-94 (Polzin); Tr. 7450-52 (McAfee) (difficulties to AMD of fixed burst length of 4); Tr. 4771-72 (Macri) ({{ }}(*in camera*)). Thus, changing standards after-the-fact is far more difficult than setting them in the first place.

Second, Rambus ignores the coordination difficulties, and resulting delay, inherent in switching technologies. Any replacement of interface technologies would require coordination among DRAM manufacturers, component makers and OEMs, and thus could only be accomplished by changing the standards in JEDEC. Tr. 4385-86, 4448-49 (Peisl); Tr. 3742-43 (Heye); Tr. 2783-84 (Krashinsky); Tr. 4767-68 (Macri) (*in camera*); Tr. 5563-80 (Jacob). Reaching consensus within JEDEC takes time,<sup>80</sup> and would be particularly difficult in the *ex-post* world because of members' differing positions and interests.<sup>81</sup> Tr. 3735-36 (Heye); Tr. 7446-52 (McAfee).

Third, Rambus ignores the additional 18-24 months needed after any revision to the JEDEC standards, and additional expense incurred, for DRAM manufacturers, component manufacturers and OEMs to implement the revised standard. *See generally* testimony of Brian

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<sup>80</sup> Rambus implies that Intel and unidentified "others" could resolve delays by "step[ping] in." RB at 77 n.41. Rambus mischaracterizes Intel's role. Intel has never unilaterally selected technologies for JEDEC standards; rather, once technologies were chosen and the JEDEC SDRAM standard completed, Intel helped define parametrics, or minor implementing details, for application of that standard. Tr. 4910-11, 4913-18 (MacWilliams).

<sup>81</sup> Rambus incorrectly assumes that lock-in effects must be uniform. According to Rambus's reasoning, if it can find one or two companies that did not believe themselves to be locked in, then nobody was locked in. RB at 75. But lock-in is a matter of degree, and varies from company to company. Tr. 7447-52 (McAfee); Tr. 4649 (Macri: "basically the earliest adopters would have had to go back to the design stage."). This is why some companies were willing to consider switching technologies in 2000, but most were not.

Shirley, Werner Reczek; Tr. 6401-02 (Appleton); Tr. 3733-34 (Heye); Tr. 5882-84 (Bechtolsheim).<sup>82</sup> Rambus cites to a Micron document for the proposition that DRAM manufacturers could switch DRAM designs. RB at 75-76. This is undisputed. Fully consistent with the time frames and expense described by Messrs. Shirley, Appleton, Heye and Reczek, the document also indicates that such a switch must start with the DRAM design, and might require purchase of different assembly and test equipment. RX0836 at 3.

Rambus argues that this cost is lower if the industry doesn't "suddenly turn-on a dime" but rather implements changes over time. RB at 74-75. This is no doubt correct. But this does not change the fact that switching technologies would still incur substantial new design, testing, qualification and ramp-up costs. Rambus also argues, relying solely on a paid technical expert, that DRAM manufacturers could "piggyback" changes on other redesigns. RB at 76. In fact, DRAM manufacturers do not combine interface design changes with shrinks or density changes specifically because doing so would increase the cost, complexity and duration of such changes. Tr. 4304-05 (Reczek); CX2108 at 254 (Oh). In other words, switching technologies would cause increased costs and delays, regardless of whether it is combined with shrinks or density changes or implemented independently.

Fourth, Rambus ignores the opportunity cost of switching technologies. Taking resources off other projects to design replacements for the technologies in question would delay the introduction of other products. Tr. 5882-83 (Bechtolsheim); Tr. 4767 (Macri) (*in camera*);

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<sup>82</sup> Contrary to Rambus's assertion that Hynix transitioned from SDRAM to DDR SDRAM in only nine months, documents indicate that it took Hynix 15 months. CX2334 at 20 (April 1999 Hyundai presentation showing that mass production of the 64M DDR SDRAM did not begin until March 1999, six months after the date claimed by Rambus). Even then, Hynix's experiences were unusual; most companies required 18-24 months to transition. Tr. 4377-78 (Peisl); *see also* 5013-16 (IBM took three years to introduce its first server using DDR SDRAM).

Tr. 6402-03 (Appleton).

Fifth, Rambus overlooks the increased design costs of future products if companies cannot reuse elements of past designs. Tr. 5835 (Bechtolsheim: companies with experience in a particular design tend to stay with it); Tr. 4780-81 (Macri: {{

}} (*in camera*); Tr. 5570-71 (Jacob: “Future designs would not be able to use already generated designs or, rather, existing designs”); Tr. 5576, 5580 (Jacob: “Future designs would need [to be] redesigned from scratch”).

Finally, Rambus ignores the fundamental point that all the costs, disruptions and delays involved in switching technologies would not lead to any improvement in product performance, but only to products that replicate the performance of products existing today. Tr. 6399-6403 (Appleton: the cost and effort would not advance technology – it would only “move sideways”). It is understandable that the industry is reluctant to undertake such an effort.

Rambus also argues that the industry followed a gradual evolution over a period of years within the SDRAM and DDR SDRAM standards (PC66-PC100-PC133 and DDR200-DDR266-DDR333-DDR400), and asks the Commission to assume that ripping technologies out of the interface standards would be equivalent. RB at 77-78. Rambus’s argument is highly misleading. Most fundamentally, Rambus mischaracterizes the PC speed grades. PC66, PC100 and PC133 all correspond to *the same DRAM design* that, happen to run at different speeds. See Tr. 3676-77 (Heye: SDRAM at different speeds); Tr. 4908 (MacWilliams); Tr. 1142 (Becker); CX2728 at 2 (PC133 is “just a new speed grade (same die and module [as PC100]”).<sup>83</sup>

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<sup>83</sup> Indeed, identical DRAMs are tested for speed after manufacture and sorted according to speed grade. Tr. 1132-35 (Becker: there is “a distribution [of speeds] across the wafer;” they do “speed-sorting, to bin them into the different various speed specifications”); Tr.

OEMs assemble processors, chipsets, DRAMs and other components that are rated for a particular speed grade (i.e., PC133) to create a system that functions at that speed, but are backwards compatible. CX2728 at 2 (“most laptops support PC100 but often run at 66”); Tr. 4886-87 (MacWilliams), 5958-59 (Bechtolsheim).<sup>84</sup>

From 1995 to 2002, OEMs introduced new designs from time to time, as did certain component manufacturers. But the PC66-PC100-PC133 evolution involved no changes to (and thus no redesign of) the DRAM interface. *See, e.g.*, CX2403 at 1 (512MB+ SDRAM datasheet showing compatibility with PC100, PC133 and PC166). The DRAM interface changed with the transition to DDR SDRAM, but again, there were no interface changes (and thus no interface redesign) involved in DDR200-DDR266-DDR333-DDR400. *See* CX2408, CX2410. Thus, the PC66-PC100-PC133 and DDR200-DDR266-DDR333-DDR400 evolutions have no bearing whatsoever on the length of time, difficulty or expense involved in replacing technologies in the DRAM interface.

The past 15 years have seen only three changes to the JEDEC standard DRAM interface: EDO => SDRAM (1988-93); SDRAM => DDR SDRAM (1993-98); and DDR SDRAM => DDR2 (1998-2003). The impact of changing the DRAM interface to replace the four technologies in question would be a major change on par with those efforts. Tr. 3732, 3733-34 (Heye); Tr. 4449-53, 4455 (Peisl); Tr. 4767, 4776-77, 4780-81 (Macri); Tr. 2788 (Krashinsky); Tr. 4304 (Reczek); *see also* Tr. 408 (Rhoden).

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3831 (Wagner); Tr. 9588 (Geilhufe); CX2728 at 2 (in 1999, 40% of Micron production expected to run at PC133, most of the remainder at PC100, with “little fallout to PC66”).

<sup>84</sup> Indeed, speed grades are sufficiently unimportant that Hewlett-Packard designed a system using fully JEDEC-compliant parts that ran at its own designated speed of 125 MHz. Tr. 2810 (Krashinsky).

## **2. Rambus Ignores Its Own Conduct.**

*A . . . [E]ven though this feature is not fundamental, it's simply convenient. Once the controller is using it . . . it becomes more difficult to not use it once you have put it in your design.*

*Q It becomes more difficult for who not to use it?*

*A The controller company, makes it more difficult for them to change and not use it.*

*CX2115 at 134 (Deposition of Fred Ware).*

In addition to ignoring the most telling evidence on lock-in – the fact that efforts to change the technologies in the JEDEC standards failed – as well as the testimony of Messrs. Bechtolsheim of Cisco, Heye of AMD, Krashinsky of Hewlett-Packard, Kellogg of IBM, Macri of ATI, MacWilliams of Intel, Wagner of Nvidia, Rhoden of AMI2, Appleton, Shirley and Lee of Micron, Drs. Peisl and Reczek of Infineon and Dr. Oh of Hynix, Rambus completely disregards its own conduct.

Rambus took great pains to conceal the scope of its patent rights precisely because it understood that changing technologies after a standard is adopted and implemented is far more difficult than initially choosing a different technology, and thus Rambus's leverage over the industry would increase after the standard was implemented. CX0919 (“do \*NOT\* tell customers/partners that we feel DDR may infringe – our leverage is better to wait”); CX0711 at 73 (“it makes no sense to alert them to a potential problem they can easily work around”); CX0533 at 15 (“Once a DRAM or vend[or] [has] committed to an architecture [it is] unlikely to change.”).

Indeed, Rambus's “forsaking” of royalties on SDRAMs (CX2105 at 105 (Mooring)) makes sense only if it could later obtain higher royalties because the cost of switching would be



greater.

### **III. Restoration of Competition Requires Entry of the Proposed Order.**

The Commission is charged with restoring competition to markets distorted by anticompetitive conduct, and has wide latitude in crafting a remedy to accomplish that end.

Rambus's arguments opposing the remedy (RB at 128-133) are flawed.

#### **A. The Proposed Remedy Falls Well Within the Commission's Broad Remedial Powers.**

Restricting Rambus's use of its intellectual property falls squarely within the Commission's remedial authority. "[T]o restore so far as is practicable competitive conditions to at least the state of health which they might have been expected to enjoy but for the unlawful conduct," the Commission may utilize the "complete array of essentially equitable remedies," even if it causes economic hardship to the respondent. *In re Ekco Prods. Co.*, 65 F.T.C. 1163, 1213, 1216-17 (1964), *aff'd*, *Ecko Prods. Co. v. FTC*, 347 F.2d 745 (7th Cir. 1965). *See also Jacob Siegel Co. v. FTC*, 327 U.S. 608, 611 (1946); *In re Firestone Tire & Rubber Co.*, 81 F.T.C. 398, 467 (1972), *aff'd*, 481 F.2d 246 (6th Cir. 1973).

The Supreme Court has held that the Commission's broad discretion includes the ability to limit, and even to ban entirely, a respondent's use of intellectual property when necessary to remedy violations of the FTC Act. *See, e.g., Ford Motor Co. v. United States*, 405 U.S. 562 (1972) (upholding FTC order limiting Ford's use of its trade name because it was designed to restore competition); *Jacob Siegel Co.*, 327 U.S. at 611-13. Contrary to Rambus's suggestion that the proposed remedy constitutes a forfeiture (RB at 132 n.91), the Supreme Court explained in *Ford* that "[e]ven constitutionally protected property rights such as patents may not be used as levers for obtaining objectives proscribed by the antitrust laws." 405 U.S. at 562 n.11 (citations

omitted).<sup>85</sup>

Contrary to Rambus's assertions (RB at 129) the proposed remedy is not tantamount to compulsory royalty-free licensing. It does not prohibit all royalties, but rather seeks to prevent enforcement of Rambus's patents beyond what would have been possible absent Rambus's conduct. CCFF 3103-12. Nor does the remedy implicate any of the specific concerns sometimes associated with compulsory licensing.<sup>86</sup> The Commission has recognized that the proper analogy is the relief courts impose in equitable estoppel cases. *See In re Dell Computer Corp.*, 121 F.T.C. 616 (1996) (consent order).

Courts routinely preclude future enforcement of patents for failure to disclose the existence of the patents or misleading conduct suggesting that patent would not be enforced. *See, e.g., Scholle Corp., v. Blackhawk Molding Co., Inc.*, 133 F.3d 1469, 1471 (Fed. Cir. 1998); *Stambler v. Diebold, Inc.*, 11 U.S.P.Q.2d 1709, 1714-15 (E.D.N.Y. 1988), *aff'd mem.*, 878 F.2d 1445 (Fed. Cir. 1989) (unpublished table opinion); *see also Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661, 670 (1944) (denying relief to patentee found to be "using the patent privilege contrary to the public interest."); *Morton Salt Co. v. G.S. Suppiger Co.*, 314 U.S. 488, 491 (1942) (denying relief to patentee engaged in improper tying.)

The Commission has recognized its authority to order compulsory, royalty-free licensing.

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<sup>85</sup> Rambus cites *FTC v. Mylan Lab, Inc.*, 62 F.Supp.2d 25 (D.D.C. 1999), to support its assertion that the proposed remedy, restricting Rambus's future enforcement of certain patents, amounts to disgorgement. RB at 132. *Mylan*, however, stands only for the proposition that the FTC can seek disgorgement in federal court, not that an order to cease and desist is the same as disgorgement of past profits.

<sup>86</sup> Rambus asserts that compulsory licensing is controversial, citing William E. Kovacic, *Designing Antitrust Remedies for Dominant Firm Misconduct*, 31 Conn. L. Rev. 1285, 1304 (1999). RB at 130, n.88. Yet, enjoining enforcement of patents covering standardized technologies would not implicate the issues raised there, *e.g.*, the need to convey know-how and oversight of compliance with licensing terms.

*See In re American Cyanamid Co.*, 72 F.T.C. 623, 690-91 (1967), *aff'd sub nom.*, *Charles Pfizer & Co. v. FTC*, 401 F.2d 574 (6th Cir. 1968). The remedy has been specifically recognized as an appropriate antitrust remedy in industries like the DRAM industry, where price competition and narrow profit margins prevail (*see* CCF 96-100, 107-11). *See United States v. General Electric Co.*, 115 F. Supp 835, 844 (D.N.J. 1953). *See also In re Bristol-Myers Squibb Co.*, 2003 FTC LEXIS 34 (consent order); *In re Eli Lilly & Co.*, 95 F.T.C. 538, 546-52 (1980) (consent order); *In re Xerox Corp.*, 86 F.T.C. 364, 373-83 (1975) (consent order).

**B. The Proposed Relief Is Necessary to Remedy Rambus's Unlawful Conduct and Restore Competition to the Affected Markets.**

The uncontested testimony of Professor McAfee demonstrates that the proposed remedy is necessary to undo the anticompetitive harm resulting from Rambus's conduct. CCF 3103-12; Tr. 7511-12, 7517, 7522 (McAfee); *see also* Tr. 5881-89 (Bechtolsheim); Tr. 536-38 (Rhoden); Tr. 2474-77 (G. Kelley). Although it is not possible to completely restore competitive conditions to those that would have existed absent Rambus's conduct, the proposed remedy will restore competitive pricing and mitigate other anticompetitive effects. Tr. 7511-12, 7517, 7522 (McAfee). Rambus offers no contrary evidence showing that any lesser remedy would effectively restore competition.

The remedy properly extends to Rambus patents beyond those that it has so far chosen to enforce against the JEDEC standards. It is well-recognized that the Commission's remedial authority extends beyond the exact practices, the exact products, or the exact assets involved in the violation. *See FTC v. Ruberoid Co.*, 343 U.S. 470, 473 (1952); *FTC v. National Lead Co.*, 352 U.S. 419 (1957); *Niresk Indus., Inc. v. FTC*, 278 F.2d 337, 343 (7th Cir. 1960); *Ekco Prods.*, 65 F.T.C. at 1216; *OKC Corp. v. FTC*, 455 F.2d 1159 (10th Cir. 1972). The Commission also

has the power to forbid acts that are lawful, when necessary “to prevent a continuance of the unfair competitive practices found to exist.” *FTC v. National Lead Co.*, 352 U.S. at 430.

**1. The Proper Remedy Applies to All Rambus U.S. Patents Claiming A Priority Date Before June 17, 1996.**

To be effective, the remedy must reach any patents that are based on applications pending while Rambus participated in JEDEC. A remedy limited to specific patents would permit Rambus to enforce future-issued patents (based on a string of applications that have been pending since 1990) against JEDEC-compliant products. Answer ¶ 101; CX1888; CX1403 at 30; CCFF 1631-74, 3116, 3220, 3225. Had Rambus properly disclosed its patent rights, JEDEC would have avoided using, or at a minimum obtained favorable rights to use, the technologies in question, and would be free from hold-up from all Rambus patents, present and future.<sup>87</sup>

To be effective, the relief also must incorporate any future generations of the JEDEC SDRAM and DDR SDRAM standards, such as the DDR-2 SDRAM standard. The evidence demonstrates that JEDEC’s standards are evolutionary; each incorporates previous generation standard. CCFF 127-28, 653, 2569-73. The DDR-2 SDRAM standard embodies this evolutionary process. *See* pages 49-50, 81-83 *supra*. Had JEDEC adopted alternative technologies in the SDRAM and DDR SDRAM standards, DDR-2 SDRAM likewise would have used alternative technologies, and would not be subject to Rambus hold-up. CCFF 3227; Tr. 7519-20 (McAfee).

**2. The Remedy Will Not Be Effective If It Does Not Apply to the**

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<sup>87</sup> Contrary to Rambus’s assertions (RB at 133), the parameters of a patent misuse defense in an infringement case have no bearing on the proposed relief. Rambus did not misuse an individual patent, but committed misconduct with respect to its entire patent family relating to multiple technologies in JEDEC standards. Rambus should not be rewarded for its crafty foresight in pursuing multiple patents on these technologies to ensure its success in reaping monopoly rents from DRAM consumers.

## Relevant Foreign Patents

The relief must also reach Rambus's foreign patents to the extent they affect U.S. imports or exports. By failing to disclose its U.S. patent rights, Rambus denied JEDEC the opportunity to consider alternatives that would have avoided infringement of Rambus's foreign patents. Rambus has strategically pursued patents in foreign countries from the outset, and continues to do so today. CX1888; CCFF 1115-20, 3200-08, 3226.

Absent a remedy reaching foreign patents, U.S. consumers likely will still pay Rambus's monopoly rents. JEDEC-compliant DRAMs are manufactured and shipped worldwide. Substantial quantities of JEDEC-compliant DRAMs, and downstream products containing DRAMs, are imported into and exported from the United States. *See* CCFF 3183, 3188-98; Tr. 6267-70 (Appleton); CX2107 at 16-20 (Oh). Absent the proposed remedy, Rambus could enforce its foreign patents against JEDEC-compliant DRAMs or downstream products imported into or exported from the United States. CCFF 3185; Tr. 7521-22 (McAfee: because the United States is a significant net importer of DRAM, foreign patent enforcement could harm U.S. consumers); Tr. 6396-98 (Appleton); Tr. 5886 (Bechtolsheim).

The cases cited by Rambus (RB at 133) observe that U.S. and foreign patents confer different rights, and only a foreign court can determine validity or infringement of a patent issued in that country. But the remedy is consistent with these holdings. It in no way affects foreign courts or foreign patent interpretation, but rather is directed at Rambus's conduct in furtherance of its patent rights, whatever those may be. Should Rambus seek to enforce foreign patents against manufacturers or users of JEDEC-compliant DRAM, the proposed order would require Rambus to carve out from its enforcement efforts DRAM imported into or exported from the United States. The remedy's international component falls well within the FTC's subject

matter jurisdiction, U.S.C. § 45(a), and is firmly supported by comity considerations. *See, e.g., United States v. National Lead Co.*, 332 U.S. 319, 337 (1947) (upholding injunction against enforcing foreign patents); *United States v. General Electric Co.*, 115 F. Supp at 851 (requiring grant of immunity for foreign patent use); *see also* U.S. Department of Justice and Federal Trade Commission, Enforcement Guidelines for Int'l Operations ¶ 3.10 (April, 1995), available at <http://www.usdoj.gov/atr/public/guidelines/internat.htm>.

## CROSS-APPEAL

### **The Rambus Cross-Appeal Should Be Denied.**

Complaint Counsel's reply to the Rambus cross-appeal<sup>88</sup> is limited to a single issue: Whether the evidence in this case should be judged under a "preponderance" standard, as the ALJ held (ID 243), or under a "clear-and-convincing" standard, as Rambus contends. RB at 134. Rambus's view is unsupported, and its cross-appeal should be denied.

As Rambus acknowledges, the burden of proof it seeks is more stringent than that applicable in "most formal adjudicative agency proceedings" like this one. RB at 134. Indeed, as the ALJ recognized (ID 241), the preponderance-of-the-evidence standard typically governs in FTC enforcement actions. *E.g.*, *In re Adventist Health System/West*, 117 F.T.C. 224, 297 (1994); *FTC v. Abbott Lab.*, 853 F. Supp. 526, 535 (D.D.C. 1994); *In re Bristol-Myers Co.*, 102 F.T.C. 21, 182 (1983) (Initial Decision); *In re Washington Crab Ass'n.*, 66 F.T.C. 45, 53 (1964) (Initial Decision).

The rule in FTC cases comports with the general rule that litigants in civil cases are required to prove facts by a preponderance. *See, e.g.*, Kenneth S. Broun *et al.*, McCormick on Evidence §339 (5th ed. 1999). The Supreme Court has held that this general standard applies specifically both to civil antitrust suits, *Herman & MacLean v. Huddleston*, 459 U.S. 375, 390 (1983), and to civil actions brought by the government, *Price Waterhouse v. Hopkins*, 490 U.S. 228, 253 (1989). Exceptions to this standard are uncommon.

Rambus relies on two arguments to contend that the prevailing "preponderance" rule

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<sup>88</sup> Complaint Counsel confines its reply to the Rambus Cross-Appeal to the following section of this brief, which responds to the single issue of law that Rambus perfected in its Cross-Appeal contained at pages 134-140 of the Rambus Answering Brief.

should be disregarded: First, it attempts to invoke a burden of proof applicable to cases involving challenges to patent validity (RB at 136), and second, it argues that the nature of the relief requires a heightened burden of proof (RB at 139). Neither argument warrants deviation from the basic “preponderance” burden in FTC cases.

**A. This Case Does Not Challenge the Validity of the Rambus Patents.**

As Rambus recognizes explicitly, “Complaint Counsel do not contend that Rambus’s patents are invalid or were obtained improperly.” RB at 1. Yet Rambus’s argument for a higher-than-usual burden relies principally on cases that base their claim of antitrust violation on precisely such allegations of misconduct in the procurement of the patent. *Id.* at 135-137, *citing, e.g., Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp.*, 382 U.S. 172 (1965); *In re American Cyanamid Co.*, 63 F.T.C. 1747 (1963); *In re VISX, Inc.*, FTC Dkt. No. 9286 (Initial Decision, May 27, 1999) (<http://www.ftc.gov/os/1999/06/visxid.pdf>)

The clear-and-convincing standard discussed in these so-called *Walker Process* antitrust cases is borrowed from specific evidentiary rules developed in the realm of patent infringement suits and cancellation proceedings to assess challenges to patent validity based on allegations of fraud on the PTO. *See, e.g., American Cyanamid*, 63 F.T.C. at 1851 n.43. The heightened burden reflects a recognition of the complexity of the patent procurement process and related concerns, such as the statutory presumption of patent validity and deference due to the PTO’s technical expertise in issuing patents. *See, e.g., Cataphote Corp. v. De Soto Chemical Coatings, Inc.*, 450 F.2d 769, 772 (9th Cir. 1971); *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1359-61 (Fed. Cir. 1984); *Handgards, Inc. v. Ethicon, Inc.*, 601 F.2d 986, 996 (9<sup>th</sup> Cir. 1979); *Walker Process*, 382 U.S. 172 (Harlan, J., concurring). The rule, therefore, is based



on the specific policy and procedural context of the patent procurement process.<sup>89</sup>

In asserting that the policy underlying the heightened standard in *Walker Process* cases applies here, Rambus relies on *Handgards, Inc. v. Ethicon, Inc.*, 601 F.2d at 996, and *Zenith Elecs. Corp. v. Exzec, Inc.*, 182 F.3d 1340 (Fed. Cir. 1999) (which cites *Handgards*). RB at 135. Significantly, however, in discussing the rationale for the heightened burden, the *Handgards* court explicitly distinguished cases such as ours – in which patent enforcement forms just part of “a larger overall scheme to monopolize” – from the two categories of patent/antitrust cases in which a heightened burden is warranted: (1) *Walker Process* cases; and (2) bad faith patent enforcement cases.<sup>90</sup> *Handgards*, 601 F.2d at 987, 994. The oft-cited *Handgards* opinion explains that the “overall scheme” cases do not warrant a heightened burden to reconcile the inherent tension between antitrust and patent law, or to protect the honest patentee, precisely because such cases, like ours, require proof of an overall scheme to monopolize independent of the procurement or assertion of patents. *Id.* at 996. It goes on to clarify that the heightened burden “is not one intended to be utilized in antitrust litigation generally.” *Id.*

The misconduct here – Rambus’s overall scheme to monopolize technology markets by subverting an open standards process – does not implicate the PTO’s patent-granting process,

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<sup>89</sup> Even in its proper context, the application of the standard Rambus seeks to import has been challenged as overly broad. *See, e.g.*, American Intellectual Property Association, AIPLA Response to the October 2003 Federal Trade Commission Report (April 21, 2004) at 5-17, available at [www.aipla.org/Content/ContentGroups/Issues\\_and\\_Advocacy/Comments2/Patent\\_and\\_Trademark\\_Office/2004/ResponseToFTC.pdf](http://www.aipla.org/Content/ContentGroups/Issues_and_Advocacy/Comments2/Patent_and_Trademark_Office/2004/ResponseToFTC.pdf), (under “well-reasoned precedent” the “clear-and-convincing” standard should apply only to proof of facts, not to their persuasive force). Rambus’s radical view, that given the “inherent tension” between patent and antitrust laws, the presence of a patent in the fact pattern of *any* antitrust case mandates a heightened burden of proof as to the legal conclusion (RB at 134-35), has no support in law or policy.

<sup>90</sup> Such cases allege that a patentee brought an infringement suit believing that its patent was invalid or had not been infringed. This case alleges neither.

challenge the validity of Rambus’s patents, or threaten to chill patent enforcement by honest patentees. Accordingly, the policies underlying a heightened burden in the cases cited by Rambus have no relevance here.

The only relevant similarity between this case and a *Walker Process* case is that each involves the intersection of patent law and antitrust law. This alone does not trigger a heightened burden. *See, e.g., United States v. U.S. Gypsum Co.*, 333 U.S. 364, 388 (1948) (finding “the preponderance of evidence at the conclusion of the government’s case indicated a violation of the Sherman Act” through the use of industry-wide patent license agreements); *In re The Roberts Co.*, 56 F.T.C. 1569, 1606 (1960) (finding proof of conspiracy through, *inter alia*, threatening patent infringement suits “sustained by reliable probative evidence.”). Indeed, the Commission’s Intellectual Property Guidelines state explicitly “[t]he Agencies apply the same general antitrust principles to conduct involving intellectual property that they apply to conduct involving any other form of tangible or intangible property.”<sup>91</sup>

In short, the rationale for a heightened burden set forth in *Walker Process* and related cases has no application here.

**B. The Relief Sought under the Proposed Order Does Not Require a Heightened Burden of Proof.**

Rambus also argues that a heightened burden is required “because of the nature of the remedy sought,” because the proposed order “seek[s] to strip Rambus of its right to recover for the use of its inventions and its right to have access to the courts to obtain judicial relief against infringers.” RB at 139. Rambus mischaracterizes the proposed relief and cites no authority that

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<sup>91</sup> U.S. Department of Justice and Federal Trade Commission, Antitrust Guidelines for the Licensing of Intellectual Property ¶ 2.1 (1995), available at <http://www.usdoj.gov/atr/public/guidelines/ipguide.htm>.

supports this proposition.

The Order would not invalidate Rambus patents or preclude their enforcement. It would not interfere with Rambus's ability to enforce any of its patents regarding Rambus architecture memory (*e.g.*, RDRAM) or any other non-JEDEC-compliant technology. It would also not apply to Rambus patents unrelated to its conduct at JEDEC. The remedy would leave Rambus free to collect royalties for all of its technologies to the extent that they have been accepted in the marketplace through legitimate competition.

Rambus cites no supporting precedent.<sup>92</sup> As the Supreme Court has explained, “Exceptions to [the preponderance-of-the-evidence] standard are uncommon, and in fact are ordinarily recognized only when the government seeks to take unusual coercive action – action more dramatic than entering an award of money damages or other conventional relief – against an individual.” *Price Waterhouse*, 490 U.S. at 253. The proposed remedy here is in no way unusually coercive, implicates no individual interests or rights, and otherwise does not merit a heightened standard. Indeed, as the Commission has recognized, the remedy sought here – precluding Rambus from enforcing its patents against JEDEC-compliant DRAM – is analogous to the relief courts routinely impose to remedy equitable estoppel. *See Dell Computer*, 121 F.T.C. at 624-625.

Neither of the arguments upon which Rambus rests its cross-appeal<sup>93</sup> is sound. This case

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<sup>92</sup> Rambus relies only on *CVD, Inc. v. Raytheon Co.*, 769 F.2d 842, 849 (1st Cir. 1985), RB at 139, which discusses bad faith patent enforcement and does not suggest that the nature of relief should determine the burden of proof.

<sup>93</sup> Rambus also contends, citing the *Infineon* decision, that a heightened burden is appropriate because of “the strong public policy considerations arising from the importance of standard-setting organizations in today’s high-tech economy” (RB at 140). However, the *Infineon* court required clear-and-convincing evidence to prove fraud only because this standard is required by Virginia’s fraud law, not because Rambus’s misconduct was in the standard-setting context. *See Rambus Inc. v. Infineon Tech. AG*, 318 F.3d at 1096. In fact, evaluation of

does not allege patent invalidity through fraud on the patent office, or bad faith enforcement of patents, for which there might be arguable basis for heightening the usual “preponderance” burden. Neither does the proposed relief exceed that commonly imposed for equitable estoppel, which is evaluated under the same “preponderance” standard applicable to civil antitrust claims. Rambus’s cross-appeal should be denied.

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anticompetitive behavior within a standards-setting organization, including the effect of the behavior on the legitimate goals and purposes of the organization, has been evaluated under the antitrust rule of reason, as discussed elsewhere in this brief. *E.g.*, *Allied Tube*, 486 U.S. 492. In that case, the courts did not require proof of anticompetitive conduct by clear-and-convincing evidence.

Finally, Rambus’s argument that the passage of time warrants a higher burden (RB at 140) is undermined by the fact that FTC actions – governed by the preponderance standard – are not bound by a statute of limitations. *See, e.g.*, *In re Simeon Mgt. Corp.*, 87 F.T.C. 1184, 1222 (1976) (the Commission can act “whenever it has reason to believe that doing so would be ‘to the interest of the public’ (15 U.S.C. § 45)”). *Accord*, *In re Internat’l Harvester Co.*, 104 F.T.C. 949, 1068 (1984). Moreover, proving this case in no way depends on strained or faded memories – volumes of contemporaneous record evidence demonstrate Rambus’s misconduct.

**CONCLUSION**

For the reasons set forth in Complaint Counsel's Appeal Brief and above, the Commission should find that Rambus violated Section 5 of the FTC Act and enter the proposed order.

Respectfully submitted,

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Dated: July 7, 2004

**CERTIFICATE OF SERVICE**

I, Hiram Andrews, hereby certify that on July 7, 2004, I caused a copy of the attached, *Reply Brief of Counsel Supporting the Complaint w/attachments*, to be served upon the following persons:

by hand delivery to:

The Commissioners  
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